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ABSTRACT

The emergence of tech-prep at the state and local levels was examined in a study of the first surveys of state and local coordinators: a survey of all 812 tech-prep consortia receiving Title IIIE funds for school year 1992-93 (response rate 86%) and a state survey of all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands (to which all but 1 coordinator responded). The study focused on the following: state role in promoting tech-prep; setting for tech-prep initiatives; organization, leadership, and resources of consortia; definition of tech-prep; participation in tech-prep programs; school and workplace content of tech-prep programs; approaches to staff development and promotion of tech-prep; student outcomes; and local evaluation of tech-prep implementation. The study established that although tech-prep has the potential to affect many students, tech-prep students still represented relatively small proportions of students in their consortium districts. Many consortia were still in a pilot phase. The current level of activity among postsecondary partners was unclear, and reporting on students appeared a major obstacle for consortia and states. Tech-prep has already laid some groundwork for transformation to school-to-work systems, however. (Sixty tables/figures are included. Appended are local survey response rates by state. Contains 10 references.) (MN)

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THE EMERGENCE OF TECH-PREP AT THE STATE AND LOCAL LEVELS

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1995

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Not only the authors, but every member of the evaluation team made important contributions to the report. At Mathematica Policy Research, Inc., Steven Rioux managed the complex data collection procedures. Lara Hulsey and Doug Almond performed the analysis programming and prepared the graphics. Jill Miller, Monica Capizzi, Liz Finnerty, Lynne Beres, and others provided able support to prepare the survey questionnaire and the report itself. Finally, Tom Owens of Northwest Regional Educational Laboratory, MPR's subcontractor for the evaluation, provided valuable input to the survey design as well as comments on the draft report.

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EXECUTIVE SUMMARY

Tech-Prep is a far-reaching reform model aimed at linking secondary and postsecondary school programs and joining the teaching of academic and occupational skills to promote continued education and acquisition of advanced technical skills. It is designed to help American youth make the transition from school to work, particularly young people who do not attend four-year colleges. The 1990 amendments to the Carl D. Perkins Vocational Act of 1984 provided guidelines and funding for Tech-Prep program development in Title IIIE, labelled the "Tech-Prep Education Act." This Act identified seven essential elements of Tech-Prep programs--articulation agreements between secondary and postsecondary institutions, a 2+2 program of study spanning the last two years of high school and two years of postsecondary study, a Tech-Prep curriculum suited to local needs, joint staff development for secondary and postsecondary instructors, training of counselors to promote effective student recruiting and post-program placement, measures to ensure access for special populations, and preparatory services to help students understand Tech-Prep and the career options to which it can provide access.[1]

Under Title IIIE of the Perkins Act, federal funds are distributed to states, which then award grants for planning and implementation to consortia of local secondary educational agencies and postsecondary institutions to plan and operate Tech-Prep programs. The U.S. Congress appropriated $63.4 million to support development of Tech-Prep programs in fiscal year (FY) 1992, an additional $90 million for use in FY 1993, and $103.7 million for use in FY 1994.

The Perkins Act also requires an evaluation of Tech-Prep. In October 1992, the U.S. Department of Education contracted with Mathematica Policy Research, Inc. (MPR) to conduct a national Evaluation of the Tech-Prep Education Program. The evaluation has two objectives. First, it is designed to describe the development of Tech-Prep nationwide--the number of programs, their characteristics, the institutions involved and populations served, and planning and implementation activities. Its second objective is to identify effective practices among a limited number of local programs and measure the progress of Tech-Prep students at those selected sites. The five-year evaluation has three data collection components--a survey of state-level Tech-Prep coordinators in the fall of 1993 and 1996, a four-year annual survey of local Tech-Prep consortia beginning in the fall of 1993, and in-depth studies of ten selected local programs over the same four years.

This report draws primarily on the first surveys of state and local coordinators.[2] It also relies to some extent for interpretation of survey data on insights from the first round of visits to in-depth study sites. The report describes nine aspects of Tech-Prep program development--the state role in promoting Tech-Prep; the local setting of Tech-Prep programs; the organization, leadership, and resources of local consortia; definitions of Tech-Prep at the local level; the extent of reported student participation in Tech-Prep; the school and workplace content of local programs; approaches to staff development and program promotion; reported student outcomes; and local efforts to evaluate Tech-Prep.

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[1]Title IIIE was later amended to allow use of Tech-Prep funds for programs spanning all four years of high school and two years of postsecondary education.

[2]All 812 Tech-Prep consortia that received Title IIIE funds for school year 1992-93 were included in the local survey sample, and 86 percent responded. The state survey included all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. All but one state coordinator responded.

The survey data provide a rich description of the progress of Tech-Prep implementation, but the following salient findings should be highlighted:

1. ***Tech-Prep consortia already have the potential to affect a high proportion of American high school students.*** More than 800 consortia were funded by Title IIIE for FY 1993, and they included 5,328 school districts. These "Tech-Prep districts" represent almost half of all school districts in the United States, and they include more than 60 percent of all secondary students.

2. ***So far only a very small fraction of students in consortium districts are actually counted as participating in Tech-Prep.*** More than 172,000 students were reported as participating in Tech-Prep in school year 1992-93. They represent an estimated 2-5 percent of all secondary students in consortium districts. This rate will likely grow as more consortia progress from the planning to the implementation stage.

3. ***Tech-Prep programs may take several years to incorporate all planned features, and many features are only gradually introduced into local consortia.*** For example, consortia that received funding earliest are more likely to have defined a required core program of Tech-Prep activities, begun using career clusters as a way to guide student course taking and making workplace experiences available, developed new curricula, and defined what it means to participate in Tech-Prep. Even when such features are developed, they may appear at first in only some of the school districts in a consortium. For example, definitions of what constitutes Tech-Prep participation and the capacity to report on participation develop gradually; although 36 percent of consortia could report some information about student participation, the data they reported pertained to only 17 percent of consortium districts.

4. ***Tech-Prep changes are so far more evident at the secondary than the postsecondary level.*** Postsecondary partners often play key leadership roles in Tech-Prep, but changes in postsecondary programs are less clear. Far fewer postsecondary than secondary schools are introducing new applied academic or occupational/technical curricula. Articulation agreements are often reported to involve revision of postsecondary courses, but evidence from the in-depth study sites suggests that articulation affects secondary courses much more often than postsecondary curriculum offerings, at least in the early program years. Promotion of cooperation between secondary and postsecondary partners continues to be identified as a primary staff development issue.

5. ***Reporting on Tech-Prep students is so far quite limited.*** In fall 1993 only about a third of consortia could report numbers of students considered in Tech-Prep in the previous year; far fewer could report on high school graduation and postsecondary activities of Tech-Prep students. Several factors explain this. Some consortia are still in the planning stage. Many have not yet defined how they would identify a "Tech-Prep student," much less enrolled students who fit the definition. Some consortia have defined participation but lack the resources or leverage to collect the data from consortium members. Finally, some consortia have defined their Tech-Prep programs in ways that make it difficult to define who is a Tech-Prep student and to count participants.

6. ***Urban areas may be underserved by Tech-Prep.*** Although urban consortia have the potential to serve many students, so far they have low rates of reported participation in Tech-Prep. In urban consortia that can report on participation, only 1 percent of high school students

participate in Tech-Prep, compared with about 6 percent and 11 percent in suburban and rural Tech-Prep consortia, respectively.

7. ***Tech-Prep has laid some of the groundwork for transformation to school-to-work systems.*** Tech-Prep has, in accord with the Title IIIE legislation, focused most heavily on school components. Consortia are implementing school-based features of school-to-work systems--choice of a career major, use of career clusters, linking of secondary and postsecondary education, articulation agreements, integration of academic and occupational learning, and various forms of career awareness and career exploration activities. Tech-Prep consortia have emphasized employment more as an outcome than as part of the program experience, and have paid relatively little attention to structured work-based learning. However, interest in work-based learning as a Tech-Prep component has grown, in part as a result of expected federal support under the recent School-to-Work Opportunities Act. More than 150 of the 702 consortia that responded to the survey said they require some kind of workplace experience for Tech-Prep students, and about another 200 consortia make them available. Most workplace opportunities are low-intensity experiences such as workplace visits, but some are more intensive activities such as paid youth apprenticeship or cooperative education placements.

THE STATE ROLE IN PROMOTING TECH-PREP

States are required to designate a "sole state agency" to administer Perkins Act grants, including Title IIIE funds. The sole state agency may also establish programmatic guidelines, collect data on consortium programs, monitor compliance with federal regulations, provide technical assistance to local programs, and supplement federal Tech-Prep funding with state dollars. The agencies may share responsibility for Tech-Prep activities with other state agencies.

The sole state agency plays the major role in Tech-Prep development. Most sole state agencies take primary responsibility for most aspects of Tech-Prep administration. For example, in 41 states, this agency takes the lead in soliciting consortium grant applications, reviewing applications, and awarding grants. However, in some states (California, Georgia, Hawaii, North Carolina, Ohio, Virginia, West Virginia, and Wisconsin), an agency other than the sole state agency appears to be leading or sharing lead responsibility for state-level Tech-Prep efforts. In five states, the sole state agency has no role or plays only a supporting role in soliciting and reviewing grant applications or awarding funds, instead delegating these responsibilities to another agency. Most states, however, involve multiple agencies in Tech-Prep.

State departments of education play the primary role in administering Tech-Prep in most (33) states. In six states, an agency responsible for postsecondary education, such as the state technical college system or board for community and technical colleges, was designated as the sole state agency. In the remaining 13 states this agency was a board, division, or commission of vocational, technical, and/or adult education.

States retain modest amounts of Title IIIE funds to cover state-level Tech-Prep administration and support. Although states are required to make grants to local consortia, they can retain some Title IIIE funds for use at the state level for administration, technical assistance, and other functions. In 30 states the sole state agency retained some funds in FY 1993 for its own use or for distribution to other state agencies--in 24 of these states, less than 10 percent of the total amount available. Two states retained more than 25 percent of the Title IIIE funds available.

Some states apply their own funds or other federal funds to support Tech-Prep development. Twelve states designated an average of $1,440,043 in state funds for Tech-Prep, and seven of them used state funds to make grants to additional local consortia or to supplement consortium grants supported by Title IIIE funds. Six states allocated funds specifically for Tech-Prep from other Perkins Act funding or non-Perkins federal programs.

Patterns of grants to local consortia suggest that Tech-Prep is expanding. Most states award grants specifically for planning, implementation, and/or demonstration. Although many consortia received funding for planning activities in FY 1993, almost the same number of planning grants were awarded in FY 1994 as in FY 1993. Since most planning grants are awarded for one year, FY 1994 planning grant awards most likely are to new consortia, rather than to those that had already received grants in previous years.

Many states are providing guidance to local consortia on Tech-Prep implementation, but only about a third have attempted to achieve statewide consistency in defining which students are considered to be Tech-Prep participants. By fall 1993, 18 states had formally adopted definitions of the goals and features of Tech-Prep, and another 27 states were working on draft definitions. States typically prescribe to local consortia the important elements of Tech-Prep; for example, about 30-35 states prescribe the target population for Tech-Prep, approaches to articulation agreements, curriculum development objectives, and how business should be involved. Almost all states provide a variety of forms of technical assistance to local consortia. However, only 18 states have a definition of what constitutes participation in Tech-Prep and require consortia to use it when reporting on Tech-Prep enrollment.

Most states monitor and collect information on Tech-Prep implementation, but few states actually have statewide databases to track participation and outcomes for Tech-Prep students. Fifty-one states had established requirements for consortia to report their progress, and most of these required consortia to report on specific topics, such as use of grant funds, staff development activity, changes in the program plan, consortium membership, and planning activities. Fewer states require consortia to report on student participation and outcomes; 34 reported that they require consortia to report the number of Tech-Prep students, and 28 require some kind of outcome data--most commonly secondary-school program completion (23 states), postsecondary program enrollment (23), postsecondary program completion (20) and students' academic skills (17). Despite these state reporting requirements, relatively few local consortia could provide counts of Tech-Prep participants and their outcomes for the national Tech-Prep survey in fall 1993. It is not surprising, therefore, that at this point only nine states reported that they were already implementing a statewide computerized database on Tech-Prep students, and that only six states reported they were testing such a database.

THE SETTING FOR LOCAL TECH-PREP PROGRAMS

Although local Tech-Prep consortia can be planned and implemented without Title IIIE funds, federal funds are a major impetus for program development. Survey data were analyzed to determine the distribution of federally funded consortia across states, census regions, and urban, suburban, and rural locations, the institutional size of consortia and the proportion of U.S. school districts included in Tech-Prep consortia. This analysis was based on the 702 consortia funded by Perkins Title IIIE grants for FY 1993 that completed the survey.

Tech-Prep consortia are particularly concentrated in the South. Of the 702 responding consortia, almost half (46 percent) were located in the Southern census region, more than twice as many as the

Western (19 percent) or Midwestern (22 percent) regions, and more than three times as many as in the Northeast (13 percent). Within all regions, there is substantial state-to-state variation in the number of consortia, mostly because of differences in state size. However, differences in the number of consortia also seem related in part to state funding practices. Some large states, such as Texas and Michigan, have encouraged and funded the organization of all or most secondary districts and community colleges into Tech-Prep consortia, but other states appear to be very selective in determining how many and which partnerships of districts and community colleges receive Title IIIE funding.

Although urban districts are relatively likely to be involved in Tech-Prep, relatively few consortia are located primarily within urban areas. A substantially higher percentage of urban school districts (69 percent) are included in Tech-Prep consortia than is true of suburban or rural districts (47 and 40 percent). However, since most school districts are suburban or rural, only 12 percent of all consortia funded in FY 1993 were primarily urban.

The number of institutions involved in Tech-Prep consortia varies widely, but about a third of all consortia involve just a handful of institutions. If consortium size is measured by the number of school districts and postsecondary institutions involved, the most common size pattern is one district and one college--representing about 15 percent of all consortia. About 300 consortia involve no more than three districts, and 322 include just one postsecondary partner. On the other hand, almost 25 percent of all consortia include more than 10 school districts, and 12 percent include five or more postsecondary institutions. Large consortia are concentrated in a few states; California, Indiana, Michigan, Pennsylvania, Wisconsin, and Texas have consortia with very large numbers of both secondary districts and postsecondary institutions. This concentration of large consortia in part reflects state decisions to organize Tech-Prep statewide. On average, suburban consortia involve more institutions than urban or rural consortia--a pattern which probably reflects the large student populations in urban districts and the relative isolation of rural districts and colleges.

Tech-Prep consortia include a large portion of U.S. school districts. The 702 consortia that responded to the survey include about 44 percent of all U.S. school districts. Actual district "coverage"--including non-responding consortia--is thus even higher.

The racial/ethnic distribution of students in Tech-Prep districts is somewhat different from the distribution of the total U.S. secondary school population. Relative to U.S. districts overall, Tech-Prep districts have a lower percentage of white students and higher percentages of African-American, Hispanic, and Asian students--probably because urban districts, with substantial minority populations, are more likely than suburban or rural districts to be in Tech-Prep consortia. As explained later, however, actual reported participation in Tech-Prep districts is lower for minority students than for white students.

THE ORGANIZATION, LEADERSHIP, AND RESOURCES OF TECH-PREP CONSORTIA

The federal Tech-Prep legislation requires the formation of consortia composed of local educational agencies and postsecondary institutions--which may include local education agencies, area vocational education schools, secondary schools funded by the Bureau of Indian Affairs, nonprofit institutions of higher education conferring two-year associate degrees or certificates or offering two-year apprenticeship programs, and some types of postsecondary proprietary schools. The legislation also encourages state agencies to favor grant applications from consortia that were developed in

consultation with business, industry, and labor unions. The local coordinator survey provides a basis for describing consortium membership and the resources available to support consortium activities.

The diversity of consortium "size" suggests variety in the meaning of consortium "membership." The Tech-Prep Education Act promotes the formation of teams of one or more secondary districts and one or more postsecondary institutions, and one might expect these consortia to be cohesive and distinct groupings working closely together to create locally accessible programs linking high school and postsecondary study. However, data from the fall 1993 survey and informal discussions with state Tech-Prep coordinators suggest that some consortia are relatively loose groupings of institutions. Some consortia are so large that close working relationships are most likely to develop only in subsets of the entire consortium, in pairings of colleges and individual districts or even schools. Nor do districts or colleges always form exclusive connections to just one consortium. About 10 percent of all secondary districts involved in Tech-Prep are members of more than one consortium; this is most common in small states and in states that have a large community college system--i.e., states where high schools or school districts are likely to be in relatively close proximity to several postsecondary institutions.

Consortia also share postsecondary institutions; about 20 percent of consortium coordinators reported articulation agreements involving more postsecondary institutions than they named as consortium members. This pattern appears to arise because some school districts seek out articulation with colleges that are formally outside their Tech-Prep consortium group, in order to expand program offerings.

Overlapping consortium membership could at some point complicate efforts to document student participation and outcomes. If consortia are the reporting unit for student outcomes, this overlap can lead to inaccurate estimates of Tech-Prep participation, due to double counting of students. Such distortions in the 1993 survey are probably small, however, since fewer than a third of the 10 percent of all consortia that include districts participating in multiple consortia reported that they were able to count Tech-Prep enrollments at all.

As expected, local education agencies and community colleges are the mainstay of Tech-Prep consortia. Virtually every consortium includes a secondary school district, and 96 percent include a two-year college. About three-quarters of all local coordinators reported that corporations were consortium members. Four-year colleges were cited as members by 39 percent of all consortia, labor groups by 18 percent, and proprietary schools by 10 percent.

Most consortia receive some kind of support from the private sector or labor groups. More than three-fourths of the consortia reported some type of support from individual businesses or corporations, business/industry or trade associations, or labor organizations in FY 1993. About 25 percent, or 170 local coordinators, reported receiving no assistance from these groups, yet about half of even these 170 consortia reported that businesses, associations, and/or labor organizations were included as consortium members. This pattern may indicate that in some consortia the involvement of these organizations may be limited to a formal role on governing boards.

Most often (in 57 percent of all consortia) business, industry, and labor groups work with Tech-Prep staff on program development--helping to develop curricula, identify required competencies, and create laboratory or other contextual learning activities. About half of all consortium coordinators reported that these groups helped to define program outcomes or to promote and market Tech-Prep. In 16 percent of all consortia, representatives from these groups taught some classes in consortium schools.

Employers are less involved in direct activities with students at the workplace. About a third of all consortia reported that business and industry provided work-based learning opportunities for students in FY 1993, but these include a variety of activities and do not necessarily resemble the "planned program of job training and work experience" envisioned in the School-to-Work Opportunities Act. It is more common for employers to offer Tech-Prep students less intensive workplace exposure activities; slightly fewer than half of the consortia reported that businesses and corporations provided career awareness opportunities for students or arranged for student tours of their facilities.

Tech-Prep resources have resulted in the creation of quite modest consortium staffs. Almost a third of all consortia reported having no professional staff dedicated either part-time or full-time to consortium-wide Tech-Prep activities, relying instead, it appears, on the efforts of existing administrators and teachers in the participating school districts and postsecondary institutions. Only 18 percent of all consortia reported staffs of two or more full-time equivalent professionals.

Consortia spend about three-fourths of their resources on administration, staff development, and equipment. Almost a quarter of consortium expenditures is for administration; grant funds are largely devoted to supporting the small staffs needed to oversee and coordinate consortium-wide activities. The bulk of remaining expenditures is for staff development (workshop leaders, staff travel and conference fees) and the purchase of curriculum materials and laboratory equipment and materials for applied academics classes.

DEFINING TECH-PREP

Although the Perkins Act sets forth a vision of Tech-Prep programs, local interpretations of the program design and implementation approaches vary widely. Title IIIE of the act states that programs must be carried out under articulation agreements among consortium members and must consist of the last two years of high school and two years of postsecondary education, leading to an associate degree or a two-year certificate. They must provide a "common core of required proficiency in mathematics, science, communications, and technologies" through a "sequential course of study," to facilitate technical preparation in engineering technology; applied science; mechanical, industrial, or practical art or trade; agriculture; health; or business. The first local consortium survey revealed, however, three dimensions in which implementation of this model varies--the basic program model or grade-span affected by local Tech-Prep plans, the development of a defined core program or set of activities in which all secondary-level Tech-Prep students are expected to participate, and the ways in which consortia define who is considered a Tech-Prep student.

Most consortia report models for Tech-Prep that begin earlier and extend later than required under the federal law applicable in 1993, which called for a "2+2" program. In fall 1993, 60 percent of consortia reported that they were working toward a Tech-Prep model that includes 10th grade or 9th and 10th grade. Of those including the early years of high school, 37 percent (22 percent of all consortia) claimed also to offer program components in middle school. Almost two-thirds of all consortia reported that their program design includes options for transfers from community colleges to four-year colleges. These reports probably reflect diverging views of what should be included under the Tech-Prep label. For example, some consortia may consider new career exposure activities for all 8th-graders as a Tech-Prep component, while others view these activities as simply an improvement to the overall career guidance system. Similarly, pre-existing articulation agreements allowing transfer of credits from community colleges to four-year colleges may be seen by some coordinators as part of an overall Tech-Prep design and not by others.

In most consortia, a defined core program has been adopted by all or some members. About 63 percent of all consortia reported that a core set of activities or courses has been defined and is required for all Tech-Prep students in at least some schools or districts in the consortium--but the survey data suggest that these core activities may not yet be so fully available that they are actually a standard part of all students' programs. In almost half of all consortia, coordinators reported that a core program has been adopted consortium-wide.

About a third of reported core programs were described as mandated by state agencies. On the other hand, many local coordinators are relatively unaware of the core programs that state coordinators say they have mandated. Although 27 state coordinators reported that their state had prescribed at least some features of Tech-Prep, in only three states did the survey show at least a 75 percent rate of local coordinator awareness of a state program definition.

Where local consortia have a defined core program, five features are commonly found. In about three-fourths or more of all consortia that have consortium-wide definitions of a core program, Tech-Prep students are expected to do one or more of the following: (1) develop a plan of study, (2) choose a broad career cluster; (3) take or complete one or more applied academic courses; (4) take required academic or occupational courses related to a career cluster, or take a minimum number of such courses as electives; (5) participate in career awareness/development activities. Workplace activities are reportedly a standard part of Tech-Prep student experiences in about half of the 336 consortia with consortium-wide definitions. These activities are usually low-intensity workplace exposure activities rather than ongoing instruction at a work site.

How consortia or local districts define a core program affects what it means to be a participant in Tech-Prep. Generally, consortia take one of two very different approaches to defining participation. Some consortia believe Tech-Prep should not be considered a distinct program because it will lead inevitably to the stigma associated with "tracking," particularly of vocational students. Consortia following this approach may not differentiate students in Tech-Prep from the general student population or may count students as in Tech-Prep if they happen to take any of the courses considered fundamental to the Tech-Prep initiative (for example, articulated vocational courses). Students, however, are unaware of their participation in a "program." On the other hand, some consortia view Tech-Prep as a true program; students apply for admission, enroll, and participate in a defined set of activities that set them apart from other students. These consortia often consider a cohesive Tech-Prep program to have the added benefit of allowing students to feel that they are part of something special, and may encourage students to wear Tech-Prep logos or take them on special field trips to reinforce this attitude. Regardless of the approach used to identify Tech-Prep students, developing a concrete definition of participation allows consortia to count Tech-Prep students and to track their outcomes.

Most consortia report that they have defined Tech-Prep participation, but these definitions vary widely. In fall 1993, more than 70 percent of the consortia reported having a definition of which secondary students are to be counted as "in Tech-Prep." In about 10 percent of these consortia, each participating school or district determined its own definition. Even consortia that did not report a definition for a core program (that is, lacked a specified set of activities required for all Tech-Prep students) reported having a definition for how to identify and count students. Slightly fewer than half (117) of the 256 consortia that did not have a core program nevertheless reported that they had a definition of participation. More established consortia are more likely to have a definition for identifying Tech-Prep students. Three-fourths of the consortia that received their first Title IIIE grant in FY 1992 reported having a definition for participation, compared with 59 percent of those that received their first grant in FY 1993.

Definitions for identifying and counting Tech-Prep students vary widely. Consortia reported 18 combinations of four criteria for counting participation--students' choice of Tech-Prep as a path, development of a four- or six-year student plan, vocational course taking, and taking applied academics classes. Some consortia defined participation more narrowly than their core program. For example, 46 of the 208 consortia that reported that applied academic courses were part of their core Tech-Prep program did not include participation in these classes in their minimum definition of Tech-Prep participation. Similarly, 76 of the 253 consortia that included vocational course taking in the definition of the core program did not include it in their definition of participation. This discrepancy may be due to some tendency for consortia to describe as part of their core program elements that have not been fully implemented, but to take a more immediate and practical approach in defining their method for counting Tech-Prep students, referring only to participation in activities that already exist.

PARTICIPATION IN TECH-PREP PROGRAMS

Despite the variety in local participation definitions, early data on the number of students participating in Tech-Prep provide a useful measure of implementation progress and potential program effects. It is important, however, to focus separately on the capacity of local consortia to report on participation and then on the patterns of participation among those that can provide data.

Most consortia had not yet begun to identify and count Tech-Prep participants in school year 1992-93. Only 36 percent could report on participation for that year--just over half of the consortia that reported they had defined what constitutes participation. Three factors so far limit participation reporting. New consortia may still be planning and determining objectives, target population, and program elements. Some consortia coordinators may not have the capacity to collect data on student participation; they may have difficulty assembling participation information from member districts, either because of inadequate data collection resources or lack of cooperation. Finally, consortia in which Tech-Prep components are made broadly available to all students and where students participate to different degrees may have greater difficulty identifying who is a Tech-Prep student than consortia where students make a clear choice of Tech-Prep as a program path.

Patterns of local capacity to report on participation appear to reflect implementation progress. Older consortia are more likely to be able to identify Tech-Prep students; 45 percent of consortia that received their first Title IIIE grant in FY 1992 were able to report Tech-Prep enrollments, compared to only 9 percent of the FY 1993 grantees. Reporting capacity is also uneven within consortia; although 36 percent of consortia nationwide could report on participation, they could do so for only 17 percent of their member districts. This pattern suggests that some consortia are in a pilot phase, concentrating implementation efforts in a few schools or districts, or that some districts have simply progressed more rapidly.

Participation reporting capacity also varies across states. In five states, more than 75 percent of consortia could identify Tech-Prep students; in three of these five, there is a single, statewide consortium. In contrast, none of the consortia in ten other states could report the number of students participating during school year 1992-93. In most states, 25 to 75 percent of consortia were able to measure participation. State policies and implementation practices affect reporting capacity. Ohio, for example, has encouraged consortia to implement programs carefully and fully before counting participants, and none of the 13 Ohio consortia reported participation numbers for the fall 1993 survey. In California, few Title IIIE grants were awarded for FY 1992, so most consortia were still in the planning stages; only one consortium had formulated and applied a definition of

participation by the time of the fall 1993 survey. Oregon has mandated a simple statewide definition of participation based on enrollment in any articulated vocational course; this strategy probably explains in part why more than half of the consortia in Oregon were able to report the number of Tech-Prep participants.

Identified Tech-Prep students are still a small proportion--less than 5 percent--of the secondary school population in consortium districts. A total of 172,882 students participated in Tech-Prep programs during the 1992-1993 school year. (Although the federal legislation focused on promoting Tech-Prep beginning in grade 11, reported Tech-Prep participation is spread quite evenly across grades 9-12.) This total was reported by the 250 consortia that were able to identify and count Tech-Prep participants during that year. In these consortia, Tech-Prep students represented 4.7 percent of all secondary students in their districts. Some consortia that did not report on participation may simply have been unable to assemble the requested data. However, the 4.7 percent must still be regarded as an upper bound estimate of the national proportion of all secondary students in consortia districts who were involved in Tech-Prep, since consortia that did not report on participation probably had students involved in Tech-Prep at lower rates. A conservative estimate of participation can be based on the assumption that consortia that did not report on participation had not yet begun to identify and count Tech-Prep students; under this assumption, Tech-Prep students would represent somewhat less than two percent of all secondary students in districts that are part of Tech-Prep consortia.

Tech-Prep students are distributed unevenly across the nation--concentrated in the South and in suburban areas. The Southern census region accounted for 62 percent of all reported Tech-Prep students in school year 1992-93, but only 46 percent of all consortia and 35 percent of all secondary students in the United States. The Northeast accounted for about 7 percent of reported Tech-Prep participants, and the Midwest and West for about 16 percent each. Suburban consortia reported 68 percent of all Tech-Prep students, while accounting for 46 percent of all consortia. Urban consortia represent 12 percent of all consortia but reported 7 percent of the total number of participants. Rural consortia accounted for about 25 percent of Tech-Prep students, but 42 percent of all consortia.

Urban areas may be underserved by Tech-Prep. Although urban school districts are very likely to be included in Tech-Prep consortia, urban consortia so far report relatively fewer Tech-Prep students than suburban and rural consortia. Among consortia that reported on participation, those located primarily in urban areas reported that only one percent of high school students participated in Tech-Prep, compared with about six percent and 11 percent in suburban and rural areas, respectively.

The racial/ethnic composition of the Tech-Prep student population differs somewhat from that of the overall student population in their school districts. Tech-Prep students are more likely to be white, and less likely to be members of a minority group. This difference is largely due to the relatively low rate at which students are reported to be participating in Tech-Prep in large urban areas that have large minority student populations.

THE SCHOOL AND WORKPLACE CONTENT OF TECH-PREP PROGRAMS

Under the Perkins Act, Tech-Prep programs are expected to provide technical preparation and to build student competence in mathematics, science, and communications through an occupationally focused sequential course of study, articulated across secondary and postsecondary levels and making use of new applied academic curricula. The School-to-Work Opportunities Act of 1994 has

heightened interest in work-based learning as a component of Tech-Prep. Data from the fall 1993 survey were therefore examined to determine the occupational emphasis of Tech-Prep programs, the extent of development and implementation of new academic and vocational curricula, the extent and types of articulation among consortium members, the career development and guidance efforts undertaken by consortium schools, and the types of workplace experiences available to Tech-Prep students.

Broad career clusters are widely defined but are used in diverse ways. By fall 1993, about two-thirds of all reporting consortia said that at least some of their school districts had defined broad career clusters. However, these groupings of more specific occupations do not necessarily represent broadly defined options for students. In only about half of the consortia where clusters are defined do students first choose a broad career area (e.g., health occupations) and then later in high school choose a more specific articulated program that they would complete at the postsecondary level (e.g., radiation technician). Where broad career clusters exist but choosing one is not required, high school students generally choose a specific vocational program for a particular occupation. In these consortia, career clusters are more likely to serve as convenient categories for forming curriculum committees and for marketing programs, even if they are not prominent in students' decision-making.

Career areas are most commonly defined in business, engineering/technology, and health and human services. More than 90 percent of the consortia with career clusters have defined a cluster for business, office skills, and marketing, and this broad cluster had the largest reported enrollment in the fall of 1993--42 percent of all Tech-Prep students reported by career cluster. Clusters in engineering/technology and health and human services were defined by almost as many consortia, but participation in them was lower--about 15-20 percent of all cluster enrollment in each area. The participation of Tech-Prep students in specific career clusters roughly parallels the distribution of students in vocational program areas as determined by the National Assessment of Vocational Education.

Introduction of new applied academic curricula is a major emphasis of Tech-Prep program development. Between 1991 and 1993, 94 percent of all consortia introduced new applied academic curricula. The heaviest focus was on mathematics; almost 75 percent of Tech-Prep consortia introduced applied mathematics curricula in at least some of their schools. More than half of the consortia established physics and/or English courses that emphasized contextual or applied learning. Applied curricula for other science subjects, such as biology and chemistry, were developed and implemented in more than 43 and 34 percent of all consortia, respectively. Consortia were slightly more likely to have purchased commercially available curricula (89 percent of consortia) than to use curricula developed locally or by their state (80 percent). Many, however, did both.

Applied academic curricula are adopted gradually within consortia. Applied mathematics, for example, has been implemented in 74 percent of consortia, but in only 37 percent of the schools in those consortia. Consortia that implemented applied curricula in other subject areas have done so in even fewer schools. However, fuller implementation of applied academic curricula may be a matter of time. FY 1992 grantees were more likely than more recent grantees to be implementing new applied academic curricula, and were implementing these curricula in a higher proportion of their schools. Consortia have so far focused most of their curriculum development efforts on the secondary level.

Recent Tech-Prep activity reflects a continued emphasis on articulation. Articulation promotes coordination between secondary and postsecondary institutions to eliminate redundancies in course work and, where possible, to facilitate collaboration on curriculum development and ongoing working

relationships. Articulation existed in many communities before the Tech-Prep consortium was created; in 17 states, at least 80 percent of the consortia reported having articulation agreements before Tech-Prep. In 38 states, more than half of the consortia had pre-existing agreements.

During the first several years of federal Tech-Prep funding, consortia made substantial efforts to develop or update articulation agreements. Many consortia in states in which articulation agreements had not been developed before Tech-Prep, (for example, Alabama, Georgia, Louisiana, Minnesota, Mississippi, and New York), did so between 1991 and 1993. Consortia that had pre-existing agreements (for example, those in California and Maryland), continued to sign agreements, either to develop articulation in new occupational specialties, or to expand to include new consortium members, or both. In all, 74 percent of consortia signed new articulation agreements in the two years preceding the fall 1993 survey. These agreements were most often signed for occupations related to business/office skills and marketing (434 consortia) and in occupations classified as mechanical/industrial/trade (341 consortia).

Articulation often focuses on courses, rather than on programs. Current articulation agreements often link individual courses rather than comprehensive programs of study. Although 527 consortia reported articulation, their lists of articulated "occupational specialties" suggest that articulation is perhaps most often a definition of the specific courses at the secondary level for which postsecondary credit will be granted. The titles of many reported occupational specialties were too narrow to reflect a program theme at either the secondary or postsecondary level; examples include Suspension and Steering, AC Circuits, Keyboarding, Machine Shop, and Turf Grass Operations. Other responses, however, may well identify programs which culminate in a degree or certificate at the postsecondary level--such as Marketing, Welding, Drafting, Electronics, Horticulture, Accounting, Office Systems, Child Care/Early Childhood Education, Machine Tool Technology, Automotive Technology, Nursing, and Office Systems.

Career development activities are common, but are defined largely by individual districts and schools rather than by a consortium-wide strategy. About 90 percent of the 702 consortia conduct individual career-counseling sessions in some or all of their member high schools, and about 50 percent conducted this activity in all participating high schools. However, career development activities are often unevenly implemented, and consortium coordinators often have trouble determining the exact nature of these activities in member districts and schools. For example, only 35 percent of the consortia that reported career-development classes were part of the core Tech-Prep experience had implemented them in all member schools.

In general, job placement is not yet a major focus of career development activity. Fewer than 30 percent of consortia reported providing any kind of job-placement assistance at the secondary level.

Workplace experiences are relatively widely available, mostly as low-intensity, optional activities. Almost two-thirds of the consortia make some type of workplace opportunity available in at least one member district. Most workplace experiences are low-intensity activities; more consortia (54 percent) provide occasional worksite visits than any other type of workplace experience, probably because these require the least commitment on the part of employers. More intensive experiences--paid or unpaid summer or school-year jobs or internships related to students' school program--are less commonly available. Internships are available to some extent in about 26 percent of consortia. Paid summer or school-year jobs are reported as available in 30 and 45 percent of all consortia, but these figures probably include cooperative education programs which have long been available in many schools, and may vary in the extent to which they involve a structured training agenda and

coordination with students' school program. Only 164 of the 440 consortia that make workplace experiences available defined them as a required part of a core Tech-Prep program.

APPROACHES TO STAFF DEVELOPMENT AND PROMOTION OF TECH-PREP

Staff development and promotion are important aspects of Tech-Prep. Tech-Prep concepts must be "sold" to a broad constituency--teachers, counselors, school administrators, business and labor, and students. Staff must become knowledgeable about basic program concepts and must be prepared for new roles. The Tech-Prep Education Act acknowledges the importance of these components and encourages consortia to use Title IIIE funds for teacher and counselor in-service training.

Most consortia made efforts to market Tech-Prep during the 1992-93 school year. About 85 percent of the consortia had conducted marketing to promote interest in and acceptance of Tech-Prep among the student population, parents, and other community members. More than 80 percent of these consortia used press releases, presentations at high schools and community colleges, or presentations to businesses and business groups. About half of the consortia promoted Tech-Prep with videos; newspaper, television, or radio advertising; or development and distribution of Tech-Prep logos and products. Most consortia used multiple marketing methods. Newer consortia were somewhat less likely to be marketing Tech-Prep, probably because they were still in the planning stage and not yet recruiting students.

Promoting interest in Tech-Prep is less critical and less common where Tech-Prep is principally an effort to articulate vocational courses, and where students are considered to be "in Tech-Prep" when they enroll in these courses. In this case, marketing Tech-Prep may not be necessary, because students and most teachers may not differentiate between Tech-Prep and preexisting vocational programs. Consortia that defined participation solely on the basis of a student's taking a vocational course were in fact less likely to report marketing efforts than consortia using other definitions.

Many consortia were still introducing staff to the basic concepts of Tech-Prep in SY 1992-93. Almost three-fourths of the consortia--both FY 1992 and 1993 grantees--reported that general Tech-Prep concepts were "highly emphasized" in staff development efforts during school year 1992-93. This emphasis may reflect the incremental nature of implementation. Consortia generally begin Tech-Prep activity in a sub-set of districts or schools, and then expand to other schools. As this expansion occurs, additional staff are likely to need a general introduction to Tech-Prep. As a result, we may continue to observe staff development on basic concepts of Tech-Prep in many consortia, even those that began implementation several years ago.

Staff development activities focused almost as much on approaches to developing curricula that improve the integration of vocational and academic instruction or promote "hands-on" learning. About 70 percent of the consortia rated these aspects of Tech-Prep curricula as "highly emphasized" staff development topics. In contrast, only about 10 percent of all consortia reported emphasizing either job placement assistance or program evaluation in their staff development activity.

STUDENT OUTCOMES

The survey of local consortium coordinators makes it possible to document the most basic Tech-Prep student outcomes and consortium capacity to report on them--high school graduation, entry into and completion of postsecondary education and training, and employment. However, many consortia

are still in the early stages of program planning and implementation, and cannot yet report on student outcomes. About 37 percent (260 consortia) have not defined a core program and about 30 percent lack definitions for identifying which students are in Tech-Prep. Fewer than half could report counts of Tech-Prep participants in school year 1992-93. Clearly, consortia that could not identify and count participants in the Tech-Prep program would be unable to document the number of students achieving key outcomes. Moreover, because many of the consortia that could report participation had only recently begun to identify students as in Tech-Prep--some starting with a first group of students in the 9th grade--data on the longer-term outcomes of interest in the national survey are not yet available from them. Figure 1 summarizes the rates at which consortia could report on outcomes, and the number of students they reported as achieving these key outcomes.

More than 12,000 Tech-Prep students in 94 consortia were reported as graduating from high school in spring 1993. The number of Tech-Prep high school graduates varied widely across states. Consortia in 11 states had more than 500 reported Tech-Prep graduates, whereas those in 19 states reported no Tech-Prep graduates in spring 1993. Small numbers of graduates were reported in other states, usually by a single consortium in that state. Reported graduation statistics reflect the gradual implementation of Tech-Prep; among the consortia that reported, graduating students came from only about half of member districts.

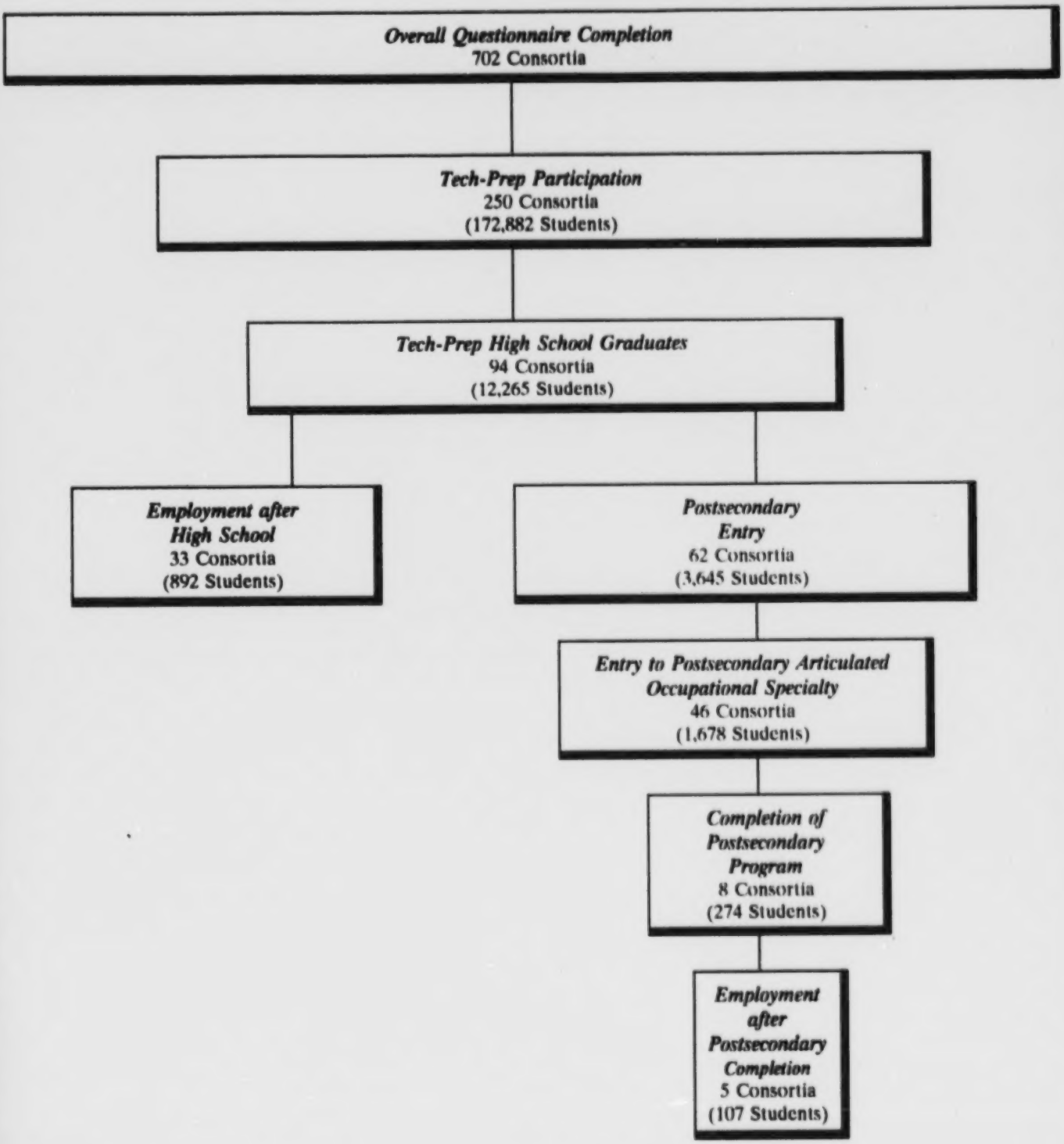
Estimating the rate at which Tech-Prep students graduate remains problematic because many consortia said they were unable to report on graduation. The 12,265 spring 1993 graduates represent 64 percent of the Tech-Prep high school seniors reported in the 94 consortia for school year 1992-1993. This computed percentage is a lower-bound estimate, however, because coordinators could report counts of Tech-Prep high school graduates for only 364 of the 417 districts for which they could report counts of Tech-Prep participants. A better estimate of the proportion of Tech-Prep seniors who graduated from high school would include some estimate of the number of graduates in districts that could report the number of seniors but not the number of graduates. If the 53 non-reporting districts had the same rate of graduation, on average, as the 364 reporting districts, we would estimate that 74 percent of Tech-Prep seniors in school year 1992-93 graduated in spring 1993.

Tech-Prep high school graduates have had diverse program experiences because of the very diverse definitions for participation and for their core programs. Twenty-three of the 94 consortia that report having graduates (about 25 percent) did not have a consortium-wide definition of participation. Of the other 71 consortia, 39 include completion of vocational and applied academic course work in their definition. Just 17 of these use a definition of participation that is similar to the Hull and Parnell model, in which a student chooses to be in Tech-Prep, develops a four- or six-year educational plan, and takes both applied academic and vocational courses.

Tracking postsecondary education is a substantial challenge in some consortia. Of the 94 consortia (13 percent) that had by the fall of 1993 reached the stage where they could report on Tech-Prep students' high school graduation, 79 stated that some Tech-Prep students had entered postsecondary education or training. However, it is often difficult for consortium coordinators to determine whether and how many Tech-Prep students have entered or completed postsecondary education or training. Eleven of the 94 consortia with Tech-Prep high school graduates did not know whether any high school graduates were entering college or other postsecondary activities. Even some consortia in which Tech-Prep students are reportedly entering postsecondary programs do not maintain records that would enable coordinators to report on their numbers. Seventeen of the 79 consortia that reported students entering postsecondary programs either did not know how many districts track postsecondary entry or knew that none of the districts had this capability and therefore were unable

FIGURE 1

SUMMARY OF SURVEY RESPONSES FOR KEY OUTCOMES IN 1993



to report actual numbers of students. Sixty-two of the 79 consortia said they had the capability to report on postsecondary entry.

Consortium size may affect the feasibility of reporting postsecondary enrollment. Small consortia may have closer relationships among members, which facilitate the tracking and collection of data on students. Small consortia also generally have fewer Tech-Prep students whose progress they must track. Among the consortia that had Tech-Prep high school graduates, smaller consortia could report on postsecondary entry in a higher proportion of member districts than could larger consortia. This finding may also reflect the fact that larger consortia are more likely to be concentrating implementation in a few districts, and to have member districts in varying stages of development; a smaller proportion of districts in these large consortia would thus be able to report Tech-Prep participation and outcomes such as postsecondary entry.

Tech-Prep students are entering postsecondary education, mostly at community colleges. The 62 consortia that could track postsecondary entry of spring 1993 graduates reported a total of 3,551 Tech-Prep students entering postsecondary education institutions or programs--slightly less than half of the Tech-Prep students who graduated from high school in those consortia in spring 1993. Of these students, about 68 percent entered two-year institutions, and about 70 percent of them were reported to have enrolled in articulated programs. About 21 percent enrolled in four-year colleges. The numbers of students entering proprietary schools, registered apprenticeship programs, or the armed forces were much smaller.

Tech-Prep students in just a few consortia have completed postsecondary degrees. Given that Tech-Prep initiatives are relatively new, we expected that only a few consortia would have had students completing the postsecondary component of the Tech-Prep program in spring 1993. Only eight consortia reported that Tech-Prep students had completed articulated postsecondary programs in spring 1993. They reported a total of 203 students receiving postsecondary degrees or certificates from articulated occupational programs.

Capacity to track employment of Tech-Prep students is for now very limited. Only half of the 94 consortia that reported spring 1993 graduates were able to obtain information on jobs that these high school graduates took. Furthermore, the 47 consortia that claimed to be able to track this information could do so in only 60 percent of their member districts overall, and in about 87 percent of the districts in which they could report Tech-Prep high school graduates. Only 33 of the 47 consortia actually reported the number of high school graduates who were employed--a total of 892 students. Only five consortia were able to report on the number of students employed after postsecondary degree attainment--a total of 107 students.

Consortia generally obtain information about student jobs in an ad hoc manner--mostly through ongoing contact with individual students. Fewer than half of the 33 consortia that reported on employment outcomes after high school graduation conducted some type of survey after students' graduation, and about one-third reported surveying students about their plans just before graduation.

LOCAL EVALUATION OF TECH-PREP IMPLEMENTATION

Although the Tech-Prep Education Act does not require grantees to conduct program evaluations, most states require consortia to document their Tech-Prep planning and implementation efforts. Fifty-one states have established consortium reporting procedures, and 28 require consortia

to report on student participation and outcomes. Local evaluations are potentially important inputs into state and federal performance reporting on Tech-Prep.

Evaluation capabilities at the local level will determine the feasibility of implementing federal performance measures. Establishing consistent performance measures will require that consortia be able to identify which students are in Tech-Prep, and track and report on the students' progress. To date, slightly more than one-third of the consortia are able to identify Tech-Prep participants, and there is some indication that, as other consortia develop further, they, too, will be able to identify participants. However, the extent to which these and other consortia can collect data on student participation and outcomes will ultimately influence how likely performance measures are to be adopted and routinely reported.

Most consortia at least have a plan for evaluating Tech-Prep. Sixty-nine percent of the consortia reported plans for evaluating the implementation and outcomes of Tech-Prep, but this proportion varies widely across states. In nine states, between 80 and 100 percent of the consortia reported having such plans, but in ten states, fewer than half of the consortia reported such plans. Older and newer consortia were equally likely to have plans.

Most consortia report they are planning to develop or are already implementing a Tech-Prep student database. Intentions to create computer systems with Tech-Prep data are relatively high. More than three-fourths of all consortia report that they expect to develop or have already developed a computerized database containing information on individual Tech-Prep students. Consortia that are testing or implementing student databases include standard transcript data more often than any other type of information--usually academic and vocational courses taken or completed, and grades attained.

Although most consortia are planning to develop Tech-Prep student databases, relatively few actually had done so by fall 1993. Older grantees were more likely to have either partially or fully implemented computer files with data on Tech-Prep students than were more recent grantees (19 percent versus 7 percent, respectively). In both groups of grantees, however, significantly more consortia were still in the planning stage (58 percent overall). Sixty-three percent of the consortia that had at least partially implemented a database also had begun to identify and report on Tech-Prep participation.

If expectations for student databases are fulfilled, state and federal collection of data on Tech-Prep will be more easily achieved. However, unless consortia accompany their efforts to develop databases with efforts to develop programs and definitions enabling them to identify students who are considered in Tech-Prep, computer systems alone will be ineffective.

Program data collection has focused mostly on informal discussion with staff. Almost all consortia are engaged in some type of information gathering about program implementation, regardless of the status of their evaluation plans or student databases. To obtain information, most consortia have relied on informal discussions with staff, rather than collecting individual student data. Seventy-two percent of the consortia reported holding small group discussions with consortium staff or governing board members, or with teachers and counselors. In contrast, about one-third held small group discussions with Tech-Prep students, and about one-fourth conducted surveys or abstracted data from records on aggregate outcomes of Tech-Prep students in consortium districts. Fewer than 50 percent of consortia that are nearing implementation of a database reported that they are already collecting data on individual Tech-Prep students for analysis.

Local coordinators see several continuing obstacles to effective Tech-Prep implementation. The most pervasive problems facing Tech-Prep programs are funding and attitudes. Negative attitudes toward vocational education and/or Tech-Prep and a lack of staff, time, and money for Tech-Prep at the secondary level were most frequently cited as serious problems--by more than two-thirds of consortium coordinators. Consortia also continue to have difficulty integrating vocational and academic education to create programs of study for Tech-Prep students; almost 60 percent cited this as a major obstacle to Tech-Prep implementation. Undoubtedly contributing to this difficulty are such factors as insufficient collaboration between vocational and academic educators and difficulties in defining and revising curricula (cited as a barrier by 37 percent and 44 percent of coordinators, respectively).

Class scheduling conflicts also affect student participation in programs of study. To implement a sequence of related, integrated academic and vocational courses, class schedules must be configured so that students can actually enroll in the relevant courses. However, almost half of consortium coordinators cited class scheduling constraints or conflicts as a significant barrier to Tech-Prep implementation. Some of these scheduling difficulties may reflect the newness of the program and a lack of full support for Tech-Prep by school administrators. Cost might also be a factor. Administrators who might be willing to offer a vocational course to a limited number of enrollees might be reluctant to set aside or schedule special academic courses for these few students, because doing so may not be cost effective.

Many local coordinators are pleased with business/industry involvement, articulation progress, state-level support, and local collaboration. Only about a quarter of all consortia reported a lack of business and industry involvement in Tech-Prep as an obstacle to implementation, and nearly half reported that getting employers involved was one of their major areas of success. Almost three-fourths of the consortia had signed new articulation agreements within the two years preceding the survey, and almost 70 percent of the coordinators cited articulation agreements as one of the most successful aspects of Tech-Prep implementation. Nearly half of the consortium coordinators reported positively on the high degree of state-level involvement in and support of Tech-Prep.

Finally, it is worth noting that local coordinators generally considered local collaboration to be an important accomplishment of their Tech-Prep initiatives. To be sure, 30 to 40 percent of local coordinators cited vocational educators' resistance to change, lack of local administrator support, and lack of collaboration between secondary and postsecondary educators or between vocational and academic educators as major implementation problems. At the same time, however, more than three-fourths of local coordinators consider administrative support for Tech-Prep to be a successful feature of their Tech-Prep planning and implementation, and more than three-fourths also reported collaboration between secondary and postsecondary educators as a successful feature.

I. INTRODUCTION

Changes in the U.S. and world economies, the American educational system, and the U.S. population have focused increasing public attention on the importance of helping American youth make the transition from school to work, particularly young people who do not attend four-year colleges. Technological transformation in the workplace and international competition have been increasing the level of technical knowledge and skills in mathematics, language, and reasoning demanded of even entry-level workers. The gap between these requirements and the skills youth bring to the labor market is an important focus of concern about preparation of the future labor force.

One promising approach to address this problem is Tech-Prep--a far-reaching reform model aimed at linking secondary and postsecondary school programs and joining the teaching of academic and occupational skills to promote continued education and acquisition of advanced technical skills. Federal legislation has provided substantial funding for the development of Tech-Prep programs, as well as a national evaluation to document their planning and implementation. The evaluation is being conducted under contract for the U.S. Department of Education by Mathematica Policy Research, Inc. (MPR). This report presents an analysis of Tech-Prep planning and implementation, based on a national survey of state and local Tech-Prep coordinators administered in fall 1993.

BACKGROUND OF THE STUDY

Although interest in some features of Tech-Prep programs has been growing for at least a decade, Tech-Prep program development has been stimulated by recent federal legislation directing funds to support their creation and implementation in all states. In 1992, the U.S. Department of Education initiated an important study of the development of Tech-Prep programs and ways to make them effective.

Tech-Prep Program Background

Tech-Prep is a response to concerns about the readiness of large segments of American youth to take up productive roles in a workplace that requires skills in the use of sophisticated technology and the ability to learn new skills and adapt to continuing change. Many American students fail to develop these skills in high school; they either go no further in their education or go on to further education but must devote much of their time to mastering basic academic skills rather than advanced academic and technical material.

Tech-Prep, formulated most clearly as a program concept by Dale Parnell (1985), is viewed as a strategy for improving the skills and employment preparation of American youth who might not otherwise pursue higher education. The Tech-Prep concept emphasizes applied learning--teaching academic materials through practical hands-on experience--and the development of clearly defined academic and technical competencies. Rather than "watering down" or neglecting academic content, this approach emphasizes finding effective ways to teach it that work with students who learn best through tangible experience. Students are to be presented with planned career "pathways" that link their high school classes to advanced technical education in community colleges, technical colleges, apprenticeship programs, or other higher education institutions. Ideally, the planned sequences of

study would develop qualifications for jobs with good pay in fields where there is strong and growing labor demand.

Federal Support for Tech-Prep

Strong interest in the Tech-Prep concept among educators and policymakers, and growing concern about strengthening skill levels among American youth, led to an emphasis on technology-oriented education in the reauthorization of the Carl D. Perkins Vocational Act of 1984. The 1990 amendments to the Act retitled the legislation the "Carl D. Perkins Vocational and Applied Technology Education Act" (referred to subsequently as the Perkins Act), and provided guidelines and funding for Tech-Prep program development in Title IIIE, labelled the "Tech-Prep Education Act."

Title IIIE of the Perkins Act identified seven essential elements of programs eligible for federal Tech-Prep funding:

- *Articulation agreements* between secondary and postsecondary institutions participating in Tech-Prep consortia, to establish the basic framework in which links can be created between secondary and postsecondary study
- *A 2+2 design*, in which a common core of math, science, communications and technology is defined for all students as a basis for more advanced and specialized courses over a four-year program sequence
- *A Tech-Prep curriculum* appropriate to the needs of each secondary and postsecondary institution--so that the overall program design makes full use of each school's resources but also takes account of the needs of its student body
- *Joint staff development for secondary and postsecondary instructors*, to promote cooperation and common understanding of objectives, overcome turf jealousies, and maximize the "seamlessness" of overall curriculum content in four-year program sequences
- *Training to promote effective student recruiting, retention, and post-program placement*, involving both secondary and postsecondary counselors
- *Measures to ensure access* for special populations such as minorities, handicapped or disadvantaged students, and students at risk of high school dropout
- *Preparatory services* such as recruiting, counseling, and assessment, to help students understand the Tech-Prep option, explore the educational and career options open to them through Tech-Prep, and make decisions concerning program and course selection and ultimate career direction

Title IIIE authorizes federal spending for Tech-Prep programs that meet the design and implementation requirements specified in the legislation. Federal funds are distributed to states, which then award grants for planning and implementation to consortia of local secondary educational

agencies and postsecondary institutions to plan and operate Tech-Prep programs. The U.S. Congress appropriated $63.4 million to support development of Tech-Prep programs in fiscal year (FY) 1992, an additional $90 million for use in FY 1993, and $103.7 million for use in FY 1994. This federal support for Tech-Prep has led to a proliferation of such programs and highlighted the need for a careful examination of the programs and their outcomes.

Mandate for the national evaluation

In addition to authorizing funding for Tech-Prep, the Perkins Act required the Secretary of Education to submit a report on the effectiveness of the program at the end of the first cycle of federal funding. In October 1992, the U.S. Department of Education, Planning and Evaluation Service, awarded a contract to Mathematica Policy Research, Inc. (MPR) and its subcontractor--Northwest Regional Educational Laboratory (NWREL)--to conduct a national evaluation of the Tech-Prep Education Program.[1]

Purpose and design of the evaluation

The Evaluation of the Tech-Prep Education Program has two primary objectives. First, it will fully describe the Tech-Prep programs funded under the Perkins Act--documenting the number of programs, their characteristics, the institutions involved, the populations they serve, and their planning and implementation activities. Second, the evaluation will identify effective practices. It will document in detail the approaches taken by mature Tech-Prep programs, as well as some newer programs with strong designs, to provide guidance to other program consortia. The evaluation will also measure the progress of Tech-Prep students in high school and postsecondary programs.

The five-year evaluation has three major data collection components:

- *A survey of state-level Tech-Prep coordinators*, to document the state role in funding and guiding the development of Tech-Prep programs--conducted twice, in the fall of 1993 and 1996
- *A survey of local Tech-Prep consortia*, to document their characteristics and development--conducted annually for four years beginning in the fall of 1993
- *In-depth studies of ten selected local programs*, to document how these programs have been planned and implemented, to describe the progress of a sample of students and to identify effective program practices--conducted annually for four years beginning in the 1993-94 school year

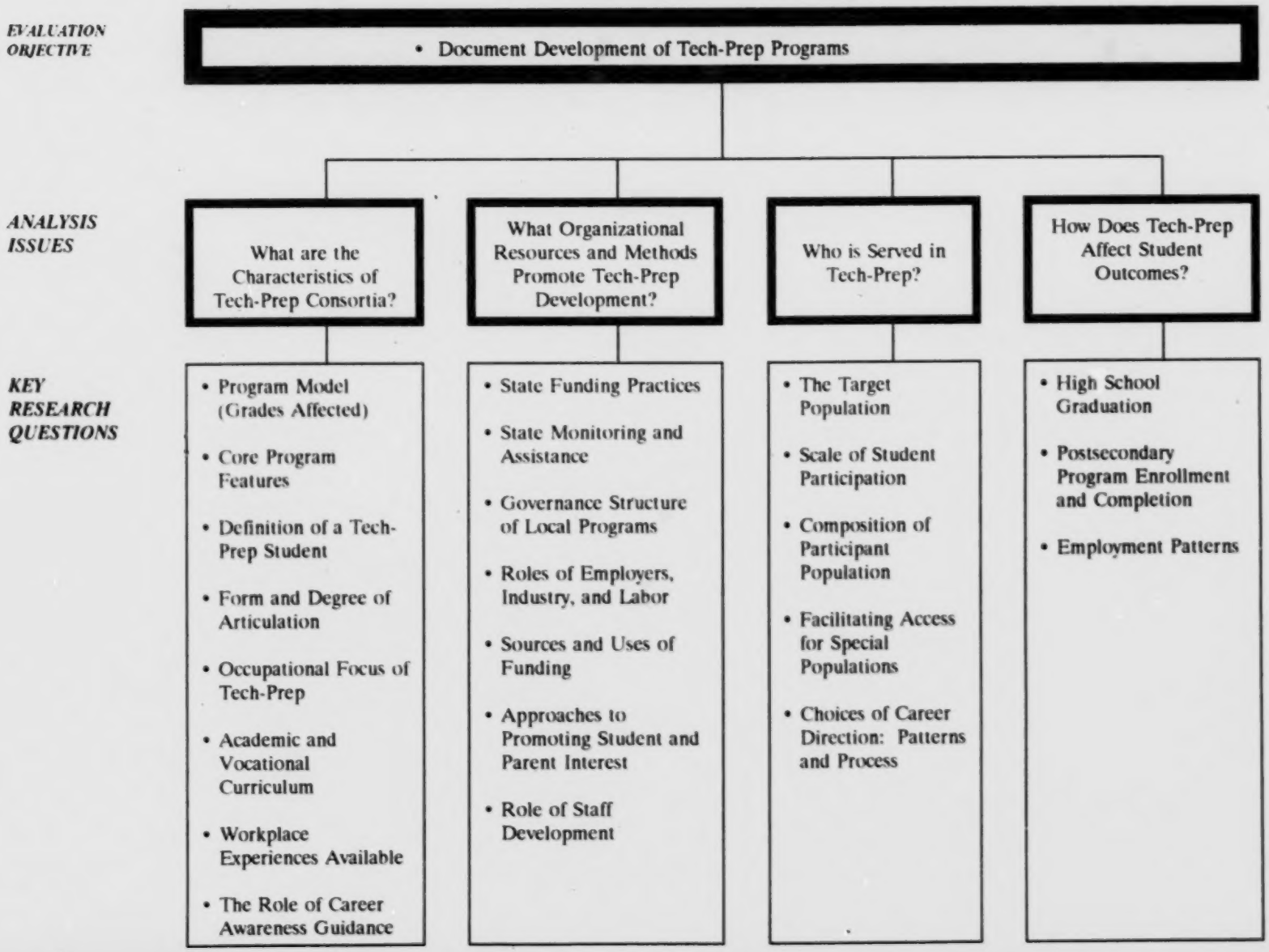
PURPOSE AND BASIS FOR THE SURVEY REPORT

The two fall 1993 surveys address the evaluation's first objective--to document the development of Tech-Prep programs. Data from the surveys provide a baseline picture of both state and local

[1]The Planning and Evaluation Service is now part of the Office of the Under Secretary.

FIGURE I.1

ANALYSIS ISSUES AND RESEARCH QUESTIONS ADDRESSED BY SURVEY REPORT


EVALUATION OBJECTIVE
• Document Development of Tech-Prep Programs
ANALYSIS ISSUES
What are the Characteristics of Tech-Prep Consortia?
What Organizational Resources and Methods Promote Tech-Prep Development?
Who is Served in Tech-Prep?
How Does Tech-Prep Affect Student Outcomes?
KEY RESEARCH QUESTIONS
• Program Model (Grades Affected)
• Core Program Features
• Definition of a Tech-Prep Student
• Form and Degree of Articulation
• Occupational Focus of Tech-Prep
• Academic and Vocational Curriculum
• Workplace Experiences Available
• The Role of Career Awareness Guidance
• State Funding Practices
• State Monitoring and Assistance
• Governance Structure of Local Programs
• Roles of Employers, Industry, and Labor
• Sources and Uses of Funding
• Approaches to Promoting Student and Parent Interest
• Role of Staff Development
• The Target Population
• Scale of Student Participation
• Composition of Participant Population
• Facilitating Access for Special Populations
• Choices of Career Direction: Patterns and Process
• High School Graduation
• Postsecondary Program Enrollment and Completion
• Employment Patterns

consortium planning and implementation that will be developed further with data from the later rounds of the surveys. This first survey report addresses four key analytic issues (Figure I.1):

- The characteristics of Tech-Prep consortia and how these are affected by differences in stage of development
- The methods and resources used to foster Tech-Prep development
- The size and general characteristics of the Tech-Prep student population
- The outcomes achieved by Tech-Prep students

This report draws on three major data sources. Data on state and local Tech-Prep implementation came from the survey questionnaires administered by MPR in fall 1993--*The Inventory of State-level Tech-Prep Activities* and *The Inventory of Local Tech-Prep Planning and Implementation*. Data on secondary district enrollments were obtained from the ED-INFO database, which contains information compiled by the U.S. Department of Education's National Center for Educational Statistics (NCES). Each of these data sources is discussed below. In addition to these three major sources, the fall 1993 visits to the ten in-depth study sites provided useful insights for interpretation of survey data.

Inventory of State-level Tech-Prep Activities

The Inventory of State-level Tech-Prep Activities--a mail survey questionnaire--was administered in fall 1993 to all 50 state Tech-Prep coordinators and to the designated area-wide coordinators for the District of Columbia, Puerto Rico, and the Virgin Islands.[2] All coordinators except one (from the Virgin Islands) responded to the survey (98 percent response rate).

The state-level survey collected data on:

- The roles of agencies involved in Tech-Prep at the state-level
- Funding practices
- Efforts to define Tech-Prep and its objectives
- Technical assistance to and monitoring of local consortia

[2]The District of Columbia, Puerto Rico, and the Virgin Islands each received allotments from Perkins Title IIIE, as did the 50 states. These territories are referred to in the remainder of the report as "states" and their coordinators are hereafter grouped with the other 50 as "state coordinators."

Inventory of Local Tech-Prep Planning and Implementation

The Inventory of Local Tech-Prep Planning and Implementation was mailed in fall 1993 to the coordinators of all Tech-Prep consortia that had received Title IIIE funding for FY 1993[3]. These coordinators were identified by their state Tech-Prep coordinators in summer 1993.

The survey of local consortium coordinators collected data on nine broad topics:

- The composition and governance structure of the consortium
- Funding and resources
- The core Tech-Prep program
- Students served
- Workplace experiences available to Tech-Prep students
- Secondary and postsecondary curriculum development and articulation
- Career development, staff development and Tech-Prep marketing
- Student outcomes
- Monitoring and evaluating Tech-Prep progress

The response to the fall 1993 survey of local coordinators was high. A total of 812 consortia funded for FY 1993 were identified and sent questionnaires; 702 consortium coordinators completed and returned their questionnaires. The overall response rate was 86 percent.[4] Response rates by state are presented in Appendix A.

ED-INFO

ED-INFO is a national statistical database containing information on all public elementary and secondary schools and districts in the United States. It is compiled each year from data collected by NCES and the U.S. Bureau of the Census. At the time of the fall 1993 survey, the database contained five years of data--from school year 1987-1988 through school year 1991-1992.

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[3]Some consortia received a grant in FY 1992 that funded Tech-Prep for multiple years.

[4]A total of 823 consortia were actually funded for FY 1993. However, during that year, 11 of these consortia either merged or consolidated with other consortia in their state. Consequently, only 812 consortia were functioning when the local survey was conducted in fall 1993 (the start of FY 1994). Our response rate is based on the 812 figure.

ED-INFO school-level data were used to reduce the response burden on local coordinators. The local survey asked coordinators to report the NCES ID number for each secondary district in their consortium. Using the district identifiers, we were able to aggregate school enrollments by high school grade and by racial/ethnic groups for districts in each consortium.[5]

SUMMARY OF MAJOR FINDINGS

The analyses presented in this report yield many interesting findings about the development of Tech-Prep nationwide. Several of these findings have implications for policy decisions concerning future support for and approaches to Tech-Prep planning and implementation.

Tech-Prep has the potential to affect many students

Title IIIE has supported the organization of many Tech-Prep consortia across the United States since its inception. More than 800 consortia were funded by Title IIIE for FY 1993, and they included 5,328 secondary districts as consortium members. These "Tech-Prep districts" represent almost half of all school districts in the United States. Moreover, Tech-Prep districts serve more than 60 percent of all secondary students in the country. These estimates are based only on districts included in consortia that responded to the 1993 survey; the proportion of districts and secondary students covered by *all* FY 1993 Tech-Prep consortia including those that did not respond is thus somewhat higher.

The number of consortia, and thus the proportion of secondary students who might be affected by Tech-Prep, is growing. For FY 1994, state agencies awarded about the same number of planning grants as they did for FY 1993. Because most planning grants are awarded for one year, FY 1994 planning grants most likely are to new consortia, rather than to those that had already received grants in previous years. In addition, ten states have stipulations in state legislation, in their state plan for vocational-technical education, or both that require the creation of local Tech-Prep programs statewide by 1995.

Tech-Prep students so far represent a relatively small proportion of students in their consortium districts

Although Tech-Prep districts serve many secondary students, the proportion of students who are so far actually participating in Tech-Prep is small. More than 172,000 students were identified and reported as participating in Tech-Prep in school year (SY) 1992-1993. This figure is a good start for Tech-Prep development, given the newness of many of the programs. However, Tech-Prep students represent under five percent of all secondary students in Tech-Prep consortium districts nationwide.

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[5]There were two limitations of the ED-INFO data. The most recent available NCES data were for school year 1991-1992, but the fall 1993 survey focused on school year or fiscal year 1992-1993. Comparisons involving both data sets thus have some imprecision. Second, six states did not report to the U.S. Department of Education on their school enrollments by racial/ethnic group. Consequently, comparisons of the racial/ethnic distribution of Tech-Prep students with the distribution of all secondary students in Tech-Prep districts exclude those states.

Reported participation in Tech-Prep is likely to grow, however. More consortia are being created. More of the existing consortia may begin to report on participation as they become more established; the survey data indicate that "older" consortia are more likely to have defined who is a Tech-Prep student and to have begun identifying and counting participants. Data on Tech-Prep students collected by the national survey may also reflect true participation better in later years of the survey. The fall 1993 survey was the first time many local coordinators had to assemble counts of Tech-Prep students from participating schools and districts. Some of these coordinators may have begun too late to collect this information and reported only partially on participation or not at all.

Many features of Tech-Prep programs take time to implement

Developing rigorous programs of study that span secondary and postsecondary learning is challenging. Many Tech-Prep consortia are still in the planning stages and others are implementing Tech-Prep components incrementally. The longer a consortium has been established the more likely it is to be implementing Tech-Prep program components.

The survey data indicate substantial differences in the extent of Tech-Prep implementation between consortia that received their first Title IIIE grant in FY 1992 and in FY 1993. The older grantees were more likely to have a defined core program, to offer career clusters as a way to guide student course taking, to have developed new curricula (particularly occupational/technical curricula), to make workplace experiences[6] available to Tech-Prep, and to have defined what it means to participate in Tech-Prep. Many of these older consortia had developed articulation agreements before receiving their first Title IIIE grant, which allows them to build Tech-Prep as an extension of an existing program feature and gives them a head start on Tech-Prep development.

Many consortia are still in a pilot phase

Most consortia were, in FY 1993, implementing components of Tech-Prep and counting Tech-Prep participants in only some of their member districts and schools. New applied curricula, a choice of career clusters, workplace experiences, and most career development activities are in place for Tech-Prep students in a relatively small proportion of secondary districts that are members of Tech-Prep consortia. Although 36 percent of consortia nationwide could report on student participation, only 17 percent of consortium districts could do so.

The current level of activity among postsecondary partners is unclear

Postsecondary partners often play key roles in the administration of Tech-Prep, but their involvement beyond those roles is not evident. All consortia include at least one postsecondary institution, almost always a two-year college. Representatives from these institutions frequently act as a fiscal agent for the consortium and/or as the designated consortium coordinator. They

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[6]Although workplace experiences were not defined as a Tech-Prep component in Title IIIE of the Perkins Act, many educators view them as a logical extension that complements school-based activity. Workplace experiences are called for in the School-to-Work Opportunities Act of 1994.

are about as likely as representatives from secondary consortium members to serve on or chair governing boards or committees that are responsible for Tech-Prep policymaking.

However, other aspects of Tech-Prep activity at the postsecondary level appear, so far, to be limited. Few postsecondary schools relative to secondary schools are currently introducing new academic curricula to reflect contextual learning or new occupational/technical curricula. Although 43 percent of the consortia with specific articulation agreements reported that these agreements involved the revision of postsecondary courses, evidence from the in-depth study sites suggests that articulation often does not affect postsecondary curriculum offerings, at least not in the early years of program development. Postsecondary representatives may work closely with district or high school staff on articulation issues, but relationships across levels are not uniformly collaborative. Promotion of cooperation between secondary and postsecondary partners continues to be a primary staff development issue for consortia and an important focus of technical assistance, according to state coordinators.

The more prominent role of secondary partners at this time may be appropriate. Promotion of and recruitment for Tech-Prep is necessarily accomplished in high schools. Career exposure activities are undoubtedly most important at the secondary level. Currently, relatively few consortia are sufficiently advanced to have already graduated Tech-Prep students and to have these students entering articulated postsecondary programs.

Urban areas may be underserved by Tech-Prep

Tech-Prep development in urban communities may face greater challenges than does the initiation and expansion of Tech-Prep in suburban or rural locales. In 1993, urban areas accounted for about 7 percent of the reported Tech-Prep students. However, urban consortia enrollments so far report the smallest proportion of their students as participating in Tech-Prep. In urban consortia that can report on participation, only 1 percent of high school students participate in Tech-Prep, compared with about 6 percent and 11 percent in suburban and rural Tech-Prep consortia, respectively.

Reporting on students is a major obstacle for consortia and for states

Data on the number of students participating in Tech-Prep and their educational and employment attainment are important measures of implementation progress and potential program effects. These data provide input to policy decisions concerning Tech-Prep and can also be used by consortium leaders for purposes of program improvement--for example, to identify potential implementation problems and formulate corrective steps.

Consortia have a long way to go in reporting on Tech-Prep students. Thirty-four states require consortia to inform state agencies of the number of students involved in Tech-Prep, and 28 of these also require data on some outcome measures. Despite these reporting requirements and reports of relatively ambitious plans for developing student databases, in fall 1993 only about one third of consortia could report numbers of students considered in Tech-Prep in the previous year; far fewer could report on high school graduation and postsecondary activities of Tech-Prep students.

Several factors can affect consortium capacity to measure participation and outcomes. First, some consortia are still in an early stage of development--planning and determining objectives, target population, and program elements. Many of these have not begun to develop a definition for identifying Tech-Prep students, much less enrolled students who fit those definitions. Second, some consortia that have formulated a definition for identifying Tech-Prep students may not be able to apply the definition because they lack the resources or leverage to collect the data from consortium members. Finally, some consortia are introducing elements of Tech-Prep as school-wide reforms that could potentially affect all students. This approach makes it difficult to define who are Tech-Prep students or to count them.

Tech-Prep has laid some of the groundwork for transformation to school-to-work systems

Facilitating students' entry into career-oriented employment is considered a key Tech-Prep objective and component. Most early models of Tech-Prep, as well as the Title IIIE legislation, emphasized employment more as an outcome of Tech-Prep than as a fundamental part of the program experience.

Interest in work-based learning as a component of Tech-Prep has developed more recently, as a result of expected federal support under the recent School-to-Work Opportunities Act. This legislation promotes development of systems of career-oriented, integrated school curricula linked to structured training and other activities at a worksite. Tech-Prep consortia may figure heavily among partnerships seeking grants under the new legislation, because many proponents believe that Tech-Prep is the natural model for the school-based component of school-to-work systems and consider workplace experiences a logical extension of Tech-Prep. Many state and local Tech-Prep coordinators feel that successful implementation of Tech-Prep gives consortia a solid basis for developing school-to-work systems.

According to data from the fall 1993 survey, Tech-Prep consortia were already implementing some important features of school-to-work systems before passage of the new act. Many of these features are common to both the idealized Tech-Prep and school-to-work models. However the components were not always widely implemented or considered a core part of the Tech-Prep program model.

Many Tech-Prep consortia are implementing the school-based features of school-to-work systems to some extent. For example, the new act requires students to choose a career major by the beginning of the 11th grade. Almost two-thirds of Tech-Prep consortia reported defining and implementing career clusters--groupings of programs of study that prepare students for related occupations--in at least one of their consortium districts. About half of these said the choice of a broad career cluster was a standard step in the core Tech-Prep program--almost always a decision made in the 11th grade or earlier. School-to-work systems are supposed to link secondary and postsecondary education. Virtually all Tech-Prep consortia have developed articulation agreements among member districts and community colleges; many of these consortia had agreements that pre-dated the formation of the consortium. Most consortia report having recently introduced new applied academic curricula, one approach to another component emphasized in the new act--integrating academic and occupational learning. So far, however, these new curricula have been implemented in fewer than 40 percent of the schools in consortia that offer them. The School-to-Work Opportunities Act also requires that career awareness and career exploration be provided as part of school experiences. Some types of career development

activities have been implemented in most Tech-Prep consortia, although not necessarily in all consortium schools.

Structured work-based learning is one component of school-to-work systems that has so far received less attention in Tech-Prep consortia. Although about three-quarters of consortia reported receiving some types of support from businesses, corporations, trade associations, and labor organizations, most of this support was directed toward reviewing curricula, helping to define outcomes, and promoting Tech-Prep. Still, more than 150 consortia reported requiring workplace experiences as part of the Tech-Prep core program, and about another 200 reported making these experiences available--to interested Tech-Prep students and, in most cases, to other students as well. These workplace opportunities range from low-intensity or occasional activities such as employer visits to activities requiring more intensive commitments from employers, such as paid youth apprenticeship positions. Some are probably cooperative education arrangements. Most of the workplace experiences available to Tech-Prep students in fall 1993 were low-intensity. The extent to which Tech-Prep students actually pursue and participate in these experiences is currently unknown.

OUTLINE OF THE REPORT

The remainder of this report is divided into nine chapters. Chapter II discusses state agencies' roles in promoting the development of Tech-Prep, including awarding grants, providing technical assistance, and monitoring and evaluating local consortia. In Chapter III we characterize the setting for Tech-Prep initiatives. We identify the distribution of consortia across census regions, states, and metropolitan areas, as well as the potential student populations that could be affected by Tech-Prep programs. In Chapter IV, we describe the organization, leadership, and resources of consortia, as well as the ways in which business, industry, and labor support local Tech-Prep development. We analyze how consortia define their program models and how they identify and count Tech-Prep students in Chapter V. Chapter VI discusses consortium capacity to report on Tech-Prep participation, and the numbers of students reportedly participating in Tech-Prep in school year 1992-1993. A description of the school-based and work-based experiences available to Tech-Prep students is presented in Chapter VII, including new curricula and the articulation of secondary and postsecondary courses and program. In Chapter VIII we outline consortium approaches to staff development and promotion of Tech-Prep. The educational and employment outcomes of Tech-Prep students is discussed in Chapter IX. Finally, in Chapter X, we describe local efforts to evaluate Tech-Prep implementation and consortium coordinators' perceptions of implementation progress.

II. THE STATE ROLE IN PROMOTING DEVELOPMENT OF TECH-PREP

The allocation of funds for local consortia through the state public vocational education systems guarantees state agencies a role in Tech-Prep. States are required to designate a "sole state agency" to administer grants appropriated through the Perkins Act, including those specifically targeted for Tech-Prep. The sole state agency may also establish programmatic guidelines on use of grant funds, collect data on consortium programs, and monitor compliance with federal regulations. The state agencies may also provide technical assistance to Tech-Prep programs, if they choose, or supplement federal Tech-Prep funding with special state dollars. The agencies may share responsibility for Tech-Prep activities with other state agencies or may direct those agencies to take the lead in developing Tech-Prep locally.

This chapter analyzes five aspects of state-level Tech-Prep activities. First, we examine the agencies involved and the resources they contribute. Second, we describe the patterns of Title IIIE funding awarded by state agencies to local consortia, and of other sources of funding for state Tech-Prep activities.[1] Third, we discuss state efforts to define Tech-Prep and its objectives. Fourth, we describe technical assistance provided by state agencies to local consortia and state evaluation of the progress of these consortia. Finally, we report on state coordinators' perceptions of Tech-Prep progress and implementation issues.

STATE AGENCIES INVOLVED IN PROMOTING AND FUNDING TECH-PREP

Tech-Prep has the potential to stimulate partnerships at the local consortium level, and can also promote collaborative efforts at the state level, where agencies representing different segments of the education system may share responsibility for Tech-Prep. Which agencies take the lead in Tech-Prep, the degree of agency staff participation in Tech-Prep activities, and the source and levels of funding for state-level activities may affect the progress of implementation in each state.

The designated sole state agency plays the major role in Tech-Prep development

The sole state agency takes the lead in most aspects of Tech-Prep planning and implementation. Most of the sole state agencies had primary responsibility for administration of Title IIIE grants in fall 1993; in 41 states, this agency took the lead in soliciting consortium grant applications, reviewing the applications, and awarding grants. More than 40 state coordinators reported that the sole state agency had primary responsibility for at least one of several other important tasks: (1) promoting awareness of and interest in Tech-Prep statewide; (2) monitoring and evaluating the progress of local Tech-Prep programs; and/or (3) preparing performance reports to the federal government. In 34 states, the sole state agency had primary responsibility for planning or leading staff development conferences/workshops for consortium members.

In five states, the sole state agency had no role or played only a supporting role in soliciting and reviewing grant applications or awarding funds; these responsibilities were primarily delegated

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[1]In most questions on funding, we asked for information about both fiscal year (FY) 1993 and FY 1994; to simplify the question in a few cases, we asked about FY 1994 only.

to another agency. In some states (California, Georgia, Hawaii, North Carolina, Ohio, Virginia, West Virginia, and Wisconsin), an agency other than the sole state agency appears to be leading or sharing lead responsibility for state-level Tech-Prep efforts.

Tech-Prep also involves other agencies at the state-level

Although the sole state agencies play a lead role, most states involve multiple agencies in the development of Tech-Prep. Tech-Prep coordinators in 35 of the 52 states reported that more than one agency was responsible for aspects of Tech-Prep planning and implementation, including fiscal matters, policymaking, monitoring, and technical assistance to local consortia. In 25 of these 35 states, two agencies shared responsibility for Tech-Prep development; in the other 10 states, three or more agencies were involved.

State departments of education play the primary role in administering Tech-Prep. In 33 states, the department of education was named as the sole state agency. In six states, an agency responsible for postsecondary education, such as the state technical college system or board for community and technical colleges, was designated as the sole state agency. In the remaining 13 states this agency was a board, division, or commission of vocational, technical, and/or adult education. In seven states in which some other agency was named as the sole state agency, the department of education was listed as a participating agency.

With the exception of the six postsecondary education agencies, all of the sole state agencies are responsible for secondary vocational education and, in 37 states, for academic education as well. Thirty-five sole state agencies oversee two-year postsecondary education--either in addition to secondary education or as their sole responsibility; 17 of the 35 are responsible for vocational/occupational programs only, and 18 are responsible for both academic and vocational two-year postsecondary education.

Agencies generally devote some staff time specifically to Tech-Prep

Virtually all of the agencies responsible for state-level Tech-Prep activities committed staff time to these activities during FY 1993. The sole state agencies of every state except Hawaii devoted staff resources to Tech-Prep; Hawaii delegated primary oversight of Tech-Prep to two other state agencies, both of which contributed staff time. In 33 of the 35 states in which multiple agencies were involved in Tech-Prep, each participating agency contributed staff time.

The amount of staff resources that agencies in different states devoted to Tech-Prep varied widely (Table II.1). In the fall 1993 survey, total reported staff resources ranged from 10 percent of one person-year in Wyoming to more than 13 person-years in Missouri. Thirteen states devoted less than one person year to Tech-Prep, and 26 states devoted between one and three person-years. Coordinators in five states (Delaware, Illinois, Iowa, Missouri, and Wisconsin) each reported more than five person-years of total staff resources. In all but nine states, the sole state agency devoted more staff resources to Tech-Prep than did the other agencies involved.

TABLE II.1

STAFF TIME DEDICATED TO TECH-PREP AND PERCENTAGE OF TITLE IIIE FUNDS RETAINED BY STATE AGENCIES IN FY 1993

State	Staff Time Dedicated to Tech-Prep in FY 1993 (Person-Years)	Percentage of Title IIIE Funds Retained by State Agencies in FY 1993
Alabama	1.50	0.00
Alaska	1.20	0.00
Arizona	1.10	5.52
Arkansas	0.86	0.00
California	4.00	0.00
Colorado	1.00	0.00
Connecticut	0.95	4.05
Delaware	12.00	8.00
District of Columbia	2.17	0.00
Florida	1.00	6.27
Georgia	1.10	0.00
Hawaii	3.60	0.00
Idaho	1.00	17.71
Illinois	6.70	4.55
Indiana	4.00	5.71
Iowa	9.20	0.00
Kansas	2.50	16.28
Kentucky	1.00	4.17
Louisiana	1.00	3.72
Maine	0.75	0.00
Maryland	2.55	8.27
Massachusetts	2.20	6.15
Michigan	1.50	2.12
Minnesota	1.50	3.08
Mississippi	2.00	0.00
Missouri	13.30	0.00
Montana	0.40	0.00
Nebraska	0.75	5.00
Nevada	0.50	0.00
New Hampshire	0.75	0.00
New Jersey	2.50	0.00
New Mexico	1.00	0.00
New York	4.00	4.96
North Carolina	0.95	1.79
North Dakota	1.02	0.00
Ohio	2.60	1.33
Oklahoma	4.50	0.00
Oregon	0.45	7.39
Pennsylvania	1.00	4.88
Rhode Island	2.50	16.15
South Carolina	4.30	9.35
South Dakota	2.80	0.00
Tennessee	1.50	28.82
Texas	4.00	1.13
Utah	0.30	1.38
Vermont	0.60	9.30
Virginia	0.90	15.36
Washington	1.13	4.90
West Virginia	2.00	5.42
Wisconsin	7.40	31.83
Wyoming	0.10	0.00
Puerto Rico	4.30	NA

SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993.

NOTE: NA means not available.

[a]Title IIIE funds available for FY 1993 include both the federal Title IIIE allotment for that year and any unspent Title IIIE funds carried over from the previous year.

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States retain varying portions of Title IIIE funds to cover state-level Tech-Prep administration and support

Although states are required under Title IIIE of the Perkins Act to make grants to local consortia, they have the option of retaining some Title IIIE funds for use at the state level. Retained funds may be used directly by the sole state agency--for administration, technical assistance, and other functions--or be reallocated for use by other state agencies that share Tech-Prep responsibilities. In 30 states, the sole state agency, which receives and generally distributes Title IIIE funds, reported retaining some funds in FY 1993 either for its own use or for distribution to other state agencies (Table II.1). In FY 1994, sole state agencies in 34 states retained some Title IIIE funds. States that did not retain Title IIIE funds for use at the state level appear to have supported their Tech-Prep roles in two ways. Some states may have explicitly appropriated state funds to cover Tech-Prep administration, monitoring, and technical assistance. Other state agencies may simply have assigned existing staff to take on Tech-Prep roles as part of their ongoing job responsibilities.

States that retained some Title IIIE funds for state-level Tech-Prep activities generally kept only a small portion. In FY 1993, 24 of the 30 states retaining funds reserved less than 10 percent of the total amount available.[2] Only two states retained more than 25 percent of the Title IIIE funds available.

Sources other than Title IIIE may provide funding for Tech-Prep

Some states allocate funding for Tech-Prep development from sources other than Title IIIE, including state budgets, other parts of the Perkins Act, other federal programs, business and industry, or foundations. Agencies in 15 states received funds for Tech-Prep from at least one of these sources, usually, state budgets (Table II.2).[3] Twelve states designated an average of $1,440,043 in state funds for Tech-Prep. Five states (Indiana, Massachusetts, Nevada, South Carolina, and Washington) allocated funds specifically for Tech-Prep from other Perkins Act funding. Agencies in Rhode Island and Massachusetts received funding from non-Perkins federal programs. Only Massachusetts received funds ($200,000) from other sources, such as business and industry or foundations.

Some state agencies share Title IIIE funding for Tech-Prep

In a small number of states, more than one member of the state-level Tech-Prep team receives Title IIIE funds to administer Tech-Prep. Of the 34 sole state agencies that retained Title IIIE funds at the state level during FY 1994, 11 distributed a portion of these funds to other state agencies involved in Tech-Prep. The sole state agencies in the remaining 23 states retained the funds for their own use in Tech-Prep activities. In 10 of these states, however, the sole state agency was the only agency reportedly involved in Tech-Prep.

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[2]The total amount of Title IIIE funding available for a given year is equal to sum of the federal Title IIIE allotment to the state plus any unspent Title IIIE funds carried over from the previous year.

[3]Data on other sources of funding were collected only for FY 1994. Data on non-Title IIIE funding may be a conservatively low estimate, since some states may pay for expenses related to Tech-Prep out of regular formula-allotted vocational education funds, and not explicitly account for them as Tech-Prep expenditures.

TABLE II.2

FUNDING FOR TECH-PREP FROM NON-TITLE IIIE SOURCES, BY STATE AND FUNDING SOURCE, FOR FY 1994
(In Dollars)

State	Other Perkins Act Funds	Non-Perkins Federal Funds	State Funds	Other Sources
Connecticut	--	--	21,000	--
Delaware	--	--	160,000	--
Illinois	--	--	3,025,000	--
Indiana	239,815	--	445,513	--
Massachusetts	800,000	695,000	--	200,000
Mississippi	--	--	300,000	--
New Jersey	--	--	900,000	--
North Carolina	--	--	125,000	--
Nevada	18,000	--	--	--
Oregon	--	--	1,800,000	--
Rhode Island	--	313,000	--	--
South Carolina	1,860,051	--	8,000,000	--
Washington	54,000	--	1,814,000	--
West Virginia	--	--	5,000	--
Wisconsin	--	--	640,000	--

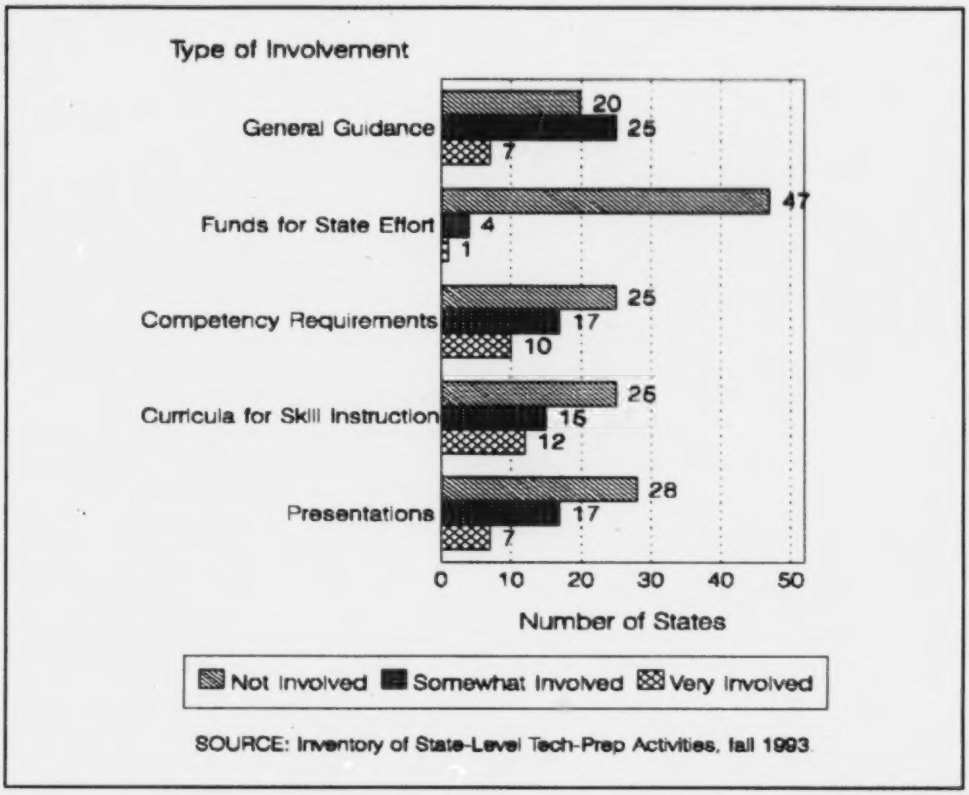
SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993.

Businesses and corporations support many state agencies with guidance and advice

In most states, employers contribute to Tech-Prep development at both the state level and the local level. In 34 states (66 percent), businesses and corporations provide some input to the state-level agencies. For the most part, this private-sector input takes the form of general guidance on Tech-Prep issues and advice on statewide competencies and development of statewide curricula (Figure II.1). Tech-Prep coordinators in seven states reported that businesses and corporations are "very involved" in providing general guidance; coordinators in 25 other states rated the groups as somewhat involved.

FIGURE II.1

INVOLVEMENT OF BUSINESSES AND CORPORATIONS
IN STATEWIDE TECH-PREP ACTIVITIES



SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993

FUNDING OF LOCAL TECH-PREP CONSORTIA

The Perkins Act mandates that states award Title IIIE grants to local consortia, either on a competitive basis or by formula allocation, but gives the states flexibility in shaping many features of their grant programs. State agencies have the latitude to determine the number and duration of grants awarded, as well as their purpose (for example, planning or implementation). The agencies also establish the formula or competitive criteria for grant awards.

Most states award separate consortium grants for planning, implementation, and/or demonstration

Awarding separate grants for different purposes or stages of consortium development is a common practice. Thirty of the 48 states that awarded grants during FY 1993 or FY 1994 awarded different categories of grants, usually for planning and for implementation, and sometimes for demonstration sites to serve as examples for other consortia in the state. The remaining 18 states made no such distinctions in awarding grants.

Across most of the grant types, the number of grants awarded and the average grant amounts were similar in FY 1993 and FY 1994 (Table II.3).[4] Although many consortia received funding for planning activities in FY 1993, almost the same number of planning grants were awarded in FY 1994 as FY 1993. Nearly identical numbers of combined planning/implementation grants and demonstration grants were awarded for the two years. Only the number of implementation grants increased, by about 17 percent. Average amounts of planning grants and implementation grants were similar in both years. However, the average amounts of combined planning/implementation grants increased in FY 1994, and the average amount of demonstration grants declined.

These results suggest that Tech-Prep is expanding. Because most planning grants are awarded for one year, FY 1994 planning grant awards most likely are to new consortia, rather than to those that had already received grants in previous years. The increase in the average amount for the combined planning/implementation grant may also indicate that consortia are developing beyond a pilot phase and expanding implementation to new districts and schools in the consortium.

Awarding grants to consortia on a competitive basis is most common

Most state agencies used a competitive process to award grants for FY 1994. Thirty-eight states reported using a competition method for at least one type of grant; competition was used most commonly--in 25 of these 38 states--to award combined planning/implementation grants. Only 11 states reported using a formula allocation for any of their Title IIIE grant awards.[5]

States that used a formula to allocate funds applied different criteria. Five of the 11 states awarded a base amount to each consortium that applied for Title IIIE funds. Three states adjusted grant amounts according to the population of vocational education students in the area served by the consortium; two states used the overall student population to determine grant amounts. In one state, Title IIIE funds were allocated on the basis of the general population in the area served by the consortium, rather than by the student population.

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[4]The total reported number of grants awarded by state agencies for FY 1993 reported here (794) and the number of FY 1993 Tech-Prep consortia referred to in Chapter III (823) differ for several reasons. The number reported by state Tech-Prep coordinators excludes grants made before FY 1993 that covered multiple years. Consortia receiving such grants were included in our estimate of FY 1993 funded consortia presented in Chapter III.

[5]Four states used both methods for their FY 1994 grant awards. In two of the four, different methods were applied to different grant categories. In the other two states, a consortium's grant could include a basic formula allocation as well as a portion determined by competition.

TABLE II.3

NUMBER AND AMOUNT OF LOCAL TECH-PREP GRANTS, BY TYPE OF GRANT
(All States)

	For FY 1993 (School Year 1992-1993)	For FY 1994 (School Year 1993-1994)
Planning Grant		
Number of grants awarded	175	167
Average grant amount	$47,637	$47,235
Minimum amount awarded	$434	$5,000
Maximum amount awarded	$250,000	$250,000
Implementation Grant		
Number of grants awarded	224	263
Average grant amount	$81,181	$79,841
Minimum amount awarded	$800	$500
Maximum amount awarded	$535,166	$400,000
Combined Planning/Implementation Grant		
Number of grants awarded	380	376
Average grant amount	$85,908	$122,279
Minimum amount awarded	$370	$990
Maximum amount awarded	$350,000	$620,700
Demonstration Grant		
Number of grants awarded	15	15
Average grant amount	$73,482	$50,920
Minimum amount awarded	$20,000	$2,500
Maximum amount awarded	$222,700	$164,950

SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993.

Most states award grants on a yearly basis

The duration of Title IIIE grants awarded varies slightly across states. Most states award grants, regardless of their type, for one year (Table II.4). Some states do not solicit applications or award grants every year, because grants are allocated for multiple years. For example, Arkansas, Montana, Tennessee, and Puerto Rico did not receive applications or award any grants for either FY 1993 or FY 1994. In other states in which multiple-year grants are awarded, new grants of some type are made each year because local consortia are on different funding cycles.

Some states allocate state funds as consortium grants

A small number of states used their own funds to supplement Title IIIE grants to consortia in FY 1994, or to make grants to consortia that did not receive Title IIIE funds. North Carolina and Illinois awarded a total of 26 grants to consortia that had not received Title IIIE funding for FY 1994 (Table II.5). Five states (Delaware, Mississippi, New Jersey, West Virginia, and Wisconsin) used state funds to supplement Title IIIE grants awarded to 36 consortia.

The total dollar amounts contributed by the seven states for local consortium development varied considerably, from $9,500 to $2,940,000. In two states, the state grants represented less than five percent of the Title IIIE federal allocation for FY 1994; in the other five states, the grant amounts were more than 20 percent of the federal Tech-Prep allotment. Illinois awarded $2,940,000 to consortia that had not received Title IIIE funds. Delaware awarded an additional $160,000 to a Title IIIE-funded consortium. In these two states, the state contribution represented about 70 percent of their total federal Title IIIE allotments.

STATE EFFORTS TO DEFINE TECH-PREP AND ITS OBJECTIVES

Although the Perkins Act provides some guidance for developing Tech-Prep programs, both the results of the national survey and earlier research suggest that consortia are currently implementing relatively diverse initiatives under the Tech-Prep banner. State agencies that oversee Tech-Prep have the discretion to provide additional direction to the consortia they fund, in order to emphasize particular program components, ensure stricter compliance with the intent of the federal legislation, or ensure greater consistency in program development within their states. Some states have chosen to define certain aspects of Tech-Prep, such as objectives, program features, or how students are counted as in Tech-Prep, and are requiring funded consortia to adopt these definitions to differing degrees.

Most states have begun to develop a formal definition of the goals and features of a Tech-Prep program

Many state agencies are in the process of defining the components of Tech-Prep for consortia in their states. By fall 1993, 18 states had already developed and formally adopted a final definition. Twenty-seven states were working on draft definitions. Of these states, 15 were preparing drafts; 3 had prepared drafts but had not yet adopted them; and 9 were using draft definitions on an interim basis. Six states had not begun to prepare a formal written definition of the objectives and features of Tech-Prep.

TABLE II.4

NUMBER OF STATES AWARDING FY 1994 TITLE IIIE GRANTS, BY GRANT DURATION AND TYPE

	States with No Grants Awarded of This Type	Number of States Awarding Grants of Specified Duration		
		One Year	Two Years	Three Years
Planning Grant	29	18	1	0
Implementation Grant	28	13	4	3
Combined Planning/Implementation Grant	15	22	1	10
Demonstration/Exemplary Programs Grant	41	7	0	0

SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993.

NOTE: Four states did not award any grants in FY 1994 and are not counted in this table.

TABLE II.5

STATE-FUNDED GRANTS AWARDED TO CONSORTIA IN FY 1994

	Number of Grants Awarded	Average State Grant Amount	Awarding States
State Grants to Consortia Without Title IIIE Funds			
All Grants--Any Type	26	$117,885	IL, NC
Planning grant	5	$25,000	NC
Implementation grant	0	$0	--
Combined planning/implementation grant	14	$142,500	IL
Demonstration/exemplary programs grant	7	$136,724	IL
State Grants to Consortia Receiving Title IIIE Funds			
All Grants--Any Type	36	$55,819	DE, MS, NJ, WV, WI
Planning grant	2	$90,000	DE, MS
Implementation grant	6	$20,000	MS
Combined planning/implementation grant	28	$61,054	MS, NJ, WV, WI
Demonstration/exemplary programs grant	0	$0	--

SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993.

States prescribe different implementation or design components for their consortia

Many states provide direct guidance to local consortia about specific approaches to or definitions of Tech-Prep, even in the absence of a formal definition (Table II.6). Among the most common secondary level program features prescribed by state agencies are the target population for Tech-Prep (36 states), approaches to articulation agreements (35 states), curriculum development objectives (33 states), and business involvement at the program level (33 states). At the postsecondary level, the most frequently prescribed components are particular features of articulation agreements, degree objectives for participants, curriculum development objectives, and business involvement.

Some states' prescriptions of Tech-Prep program features already cover issues that will become more important under the recently enacted School-to-Work Opportunities Act. Under this law, states and localities will receive special grants to develop systems of integrated curricula and work-based learning focused on broad occupational themes. Some of these local efforts will undoubtedly build on Tech-Prep initiatives. It is likely that state educational agencies, many of which are already involved in Tech-Prep, will be important partners in the effort to promote and coordinate school-to-work systems. At the time of the fall 1993 survey, about a third of the state agencies were prescribing for Tech-Prep consortia particular approaches to important components of school-to-work programs, such as skill certification, skill standards, and work-based learning.

State definitions of Tech-Prep participation are relatively uncommon

Relative to states that have defined goals and features of Tech-Prep programs, relatively few states have developed and adopted a definition of who is to be considered a Tech-Prep student. In the fall 1993 survey, 25 state coordinators reported that their states had not developed a definition for Tech-Prep participation. Nine coordinators reported that a state definition had been developed, but that local consortia were not obligated to adhere to it. Eighteen states have a definition for participation and require consortia to use it when reporting on Tech-Prep enrollment. The extent to which local consortia have actually adopted state definitions of what it means to be "in Tech-Prep" is discussed in Chapter V.

Some states have mandated Tech-Prep expansion

Increasing the number and development of Tech-Prep consortia is an explicit objective in some states. Ten states have stipulations in state legislation, in their state plan for vocational-technical education, or both that require the creation of local Tech-Prep programs statewide.[6] Seven of the 10 impose this responsibility or requirement on local school boards, and 4 states require community, technical, and junior colleges to respond to the mandate. These states have set various target dates for the initiation of Tech-Prep consortia in all areas of the state; all expect to have created Tech-Prep programs statewide by September 1995.

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[6]Arkansas, the District of Columbia, Florida, Idaho, Illinois, Indiana, Michigan, Mississippi, Rhode Island, and Wisconsin.

TABLE II.6

TECH-PREP FEATURES PRESCRIBED FOR LOCAL CONSORTIA BY STATE AGENCIES
(Number of States)

Prescribed Feature	At the Secondary Level	At the Postsecondary Level
Target Population	36	22
Features of Articulation Agreements	35	33
Types of Postsecondary Institutions	NA	25
Credential/Degree Objectives	28	34
Approaches to Skill Certification	14	13
Curriculum Development Objectives	34	29
Development/Adoption of Occupational Skills Standards	19	17
Type and/or Amount of Staff Training	22	18
Approaches to Career Guidance	27	20
Methods to Facilitate Access for Special Populations	20	14
Preparatory Services for Students	22	12
Grade when Students Choose Career Clusters	27	12
Requirements for a Database/Tracking System	19	16
Criteria for Assessing Program Performance	24	22
Involvement of Program-Level Business Advisory Groups	33	31
Inclusion of Work-Based Learning Components	16	13

SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993.

Particular types of postsecondary transitions are facilitated by state-level efforts

Some states reported taking action at the state level to promote a variety of links between secondary and postsecondary institutions. For example, 37 states had made efforts to develop or promote development of articulation agreements that include four-year postsecondary institutions. Agencies in 17 states had established statewide agreements or regulations under which four-year institutions would recognize secondary applied academic courses for college admissions. Twenty-six states had made efforts specifically to promote articulation between secondary schools and registered apprenticeship programs.

STATE TECHNICAL ASSISTANCE AND EVALUATION

State agencies can play an important role in Tech-Prep development that goes beyond the allocation of grants to local consortia. The extent of state non-financial support and assistance to consortia can greatly affect the pace of local program implementation, and enable consortia to direct resources effectively. State-level evaluation and data collection requirements and guidance can promote greater accountability among local consortia, provide feedback to enhance program implementation, and offer information necessary for state and federal policy development.

State agencies help to promote Tech-Prep statewide

Every state reported working to increase general awareness of Tech-Prep concepts statewide during FY 1993. The vast majority of states conducted workshops or conferences about Tech-Prep (49 states) and/or used print media, such as press releases or fliers, to distribute information (42 states). Thirty states distributed Tech-Prep videos for promotional purposes. Fewer than 10 states relied on radio or television announcements.

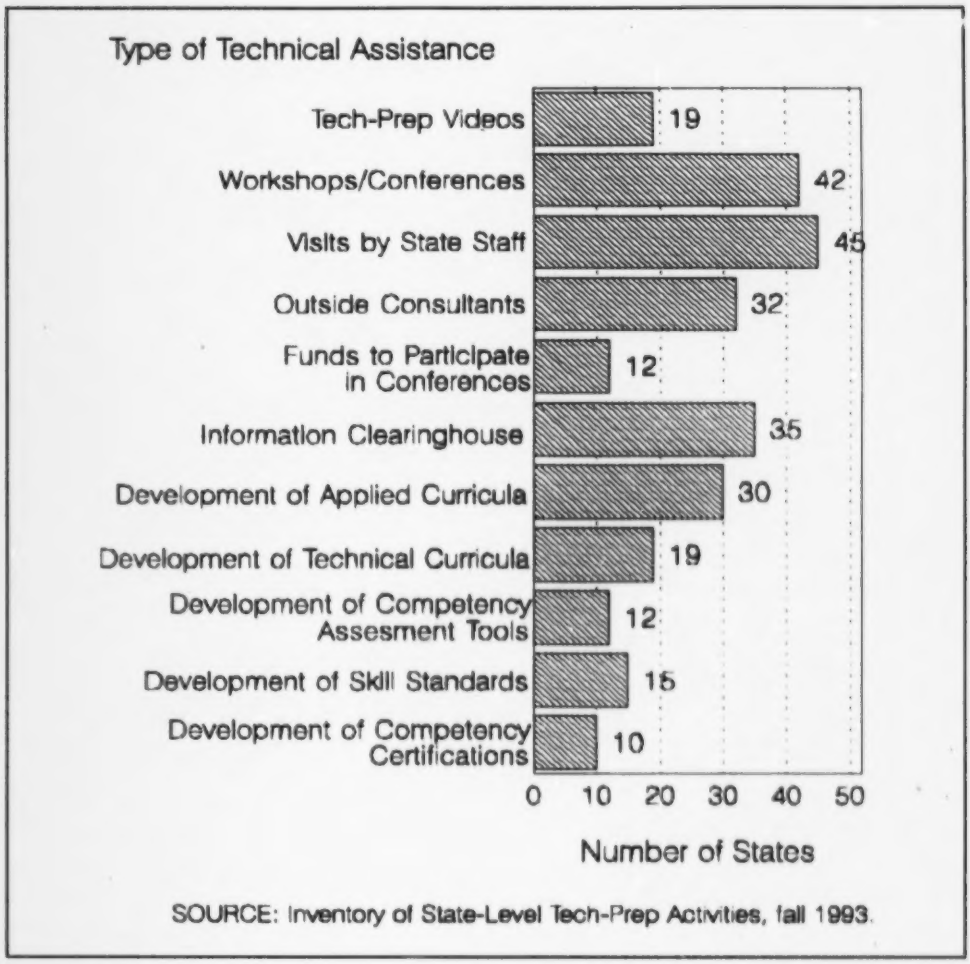
Virtually all states provided technical assistance to local Tech-Prep consortia

Most states actively support the development of local consortia. State agency staff in 48 of the 52 states reported making a substantial effort during FY 1993 to provide technical assistance to help local Tech-Prep consortia plan, implement, or enhance their Tech-Prep programs.

States reported engaging in many technical assistance activities during FY 1993 (Figure II.2). In 45 states, state agency staff visited at least some local consortium sites to work with them on program development issues. In 42 states, state-level personnel conducted workshops or conferences for consortium staff. In somewhat fewer states (32), agency personnel arranged for consultants to help individual Tech-Prep programs. Thirty of the 48 states that worked to provide technical assistance developed applied academic curricula at the state level for use by local programs. Less common state technical assistance activities included developing new technical curricula, competency assessment tools, skill standards, and methods for skill certification.

FIGURE II.2

STATE TECHNICAL ASSISTANCE METHODS, FY 1993



SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993.

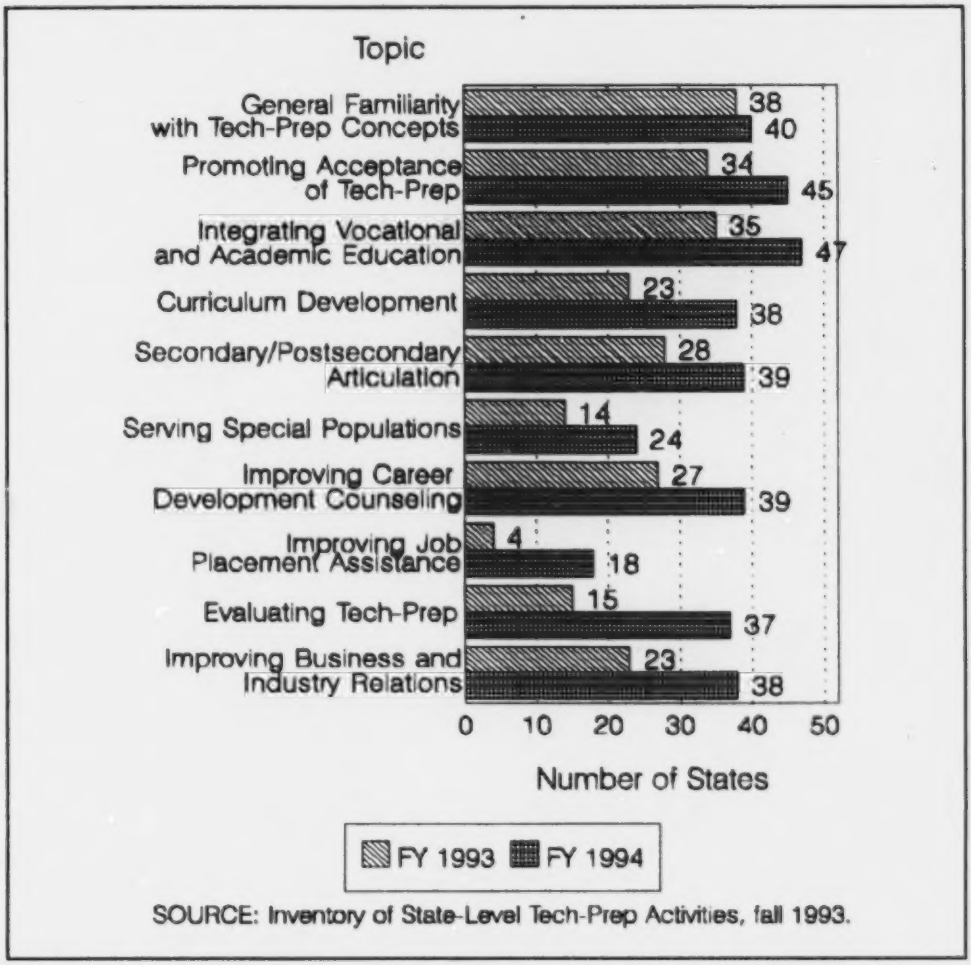
Workshops conducted by state agency staff cover a wide range of Tech-Prep topics

Responses from state Tech-Prep coordinators to the fall 1993 survey suggest that many topics are considered important at conferences or workshops held by state staff. Fifty-one states held statewide or regional conferences during FY 1993 that either focused entirely on Tech-Prep (40 states) and/or that included discussion of Tech-Prep issues on the agenda (48 states). Montana was the only state that did not organize workshops or conferences addressing Tech-Prep topics that year.

State coordinators considered many staff development/technical assistance topics to have been important in FY 1993 and indicated that these topics would continue to be important in FY 1994 (Figure II.3).

FIGURE II.3

STATE COORDINATOR PERCEPTIONS OF IMPORTANT TECHNICAL ASSISTANCE TOPICS



SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993.

The topics that state coordinators consider most critical focus on the general approach to Tech-Prep, rather than on specific implementation features. These ratings suggest that many consortia are still working on basic Tech-Prep concepts.

Monitoring local consortia is a common practice

Nearly all states have established consortium monitoring and reporting procedures. During FY 1993, staff in 44 states visited at least some consortia to monitor their progress. Fifty-one states had established procedures obligating consortia to report their progress to state agencies. All but three of the 51 states had developed a schedule of submission for these local consortium reports. Twenty-seven states required reports once per year, 11 states required them twice per year, and the rest required them three or four times each year.

Forty-six states required consortia to submit specific elements in their reports to state agencies. The most commonly required topics were reports on the use of grant funds (45 states), staff development activity (40 states), changes in the program plan (36 states), consortium membership (34 states), and planning activities (33 states). Implementation problems, approaches to program evaluation, and results of program evaluation are required report components in about 30 states.

Some states require consortia to report on student participation and outcomes

Consortium documentation of student participation and outcomes is reportedly a priority in many states. Thirty-four states require consortia to inform state agencies of the number of students involved in Tech-Prep, and 28 of these also require data on some outcome measures. State agencies most frequently required outcome data on secondary-school program completion (23 states), postsecondary program enrollment (23 states), postsecondary program completion (20 states), and students' academic skills (17 states). Reports on job placements and students' technical skills/competencies were required in 15 and 14 states, respectively.

Despite these reporting requirements, relatively few consortia could provide counts of Tech-Prep participants and their outcomes for the national Tech-Prep survey in fall 1993. The extent of and possible barriers to consortium reporting of these data are discussed in greater detail in Chapters VI and IX.

Few states have implemented databases of Tech-Prep student data

Most state coordinators reported creating or planning to create computerized databases containing information on individual Tech-Prep students. These databases may be extensions of or additions to existing state-level computer recordkeeping, rather than systems developed exclusively to document Tech-Prep students.

As of fall 1993, most states either lacked a plan to develop a system (12 states) or were in the process of planning one (25 states). Six states reported testing a database. Nine states were implementing a computerized student database, either partially (seven states) or fully (two states).[7] Among the 40 consortia that were planning (or had implemented) a database, the most common secondary level-elements expected to be included in the systems are enrollment by career cluster or occupational specialty (33 states), diploma or degree attainment (28 states), and job placement data (28 states).

These state databases largely depend on local collection of data. The extent to which consortia are able to and actually collect data on Tech-Prep students is explored in Chapter X.

STATE PERCEPTIONS OF TECH-PREP PROGRESS AND IMPLEMENTATION ISSUES

State coordinators' views of Tech-Prep implementation in their states may provide some important input into ongoing policy development on both Tech-Prep and School-to-Work programs. Perceptions of advances made in and current barriers to Tech-Prep implementation at both the state

[7]Partial implementation was defined as having a computerized system in which data were available on some Tech-Prep students or some areas of the state, but not on all students or areas.

and local levels offer federal and state officials some guidance on areas that should receive greater or lesser emphasis in discussions of reauthorization of the Perkins Act.

Most state coordinators believe their state has made progress in many aspects of Tech-Prep implementation

Overall, state coordinators are generally pleased with the degree of Tech-Prep development in their states. Coordinators in more than 40 states reported having made some progress or a great deal of progress in each of nine areas (Table II.7). The areas of greatest progress cited by the most coordinators were (1) creating local consortia, (2) infusing Tech-Prep into state or local education reform, and (3) meeting the needs of students who are not bound for four-year colleges.

Despite consortium reporting requirements and ambitious plans for state development of computerized databases, state coordinators indicated that the least progress has been made in collecting and using consortium data on student outcomes. Similarly, although virtually all coordinators reported that state agencies promoted Tech-Prep statewide, the development of state Tech-Prep marketing capacity was rated as an area in which relatively little progress has been made.

The most substantial obstacles to Tech-Prep implementation are attitudinal

Confirming research by Layton and Bragg (1991), state coordinators reported that community behaviors and perceptions are greater barriers to Tech-Prep development than are details of specific program features (Figure II.4). Coordinators most frequently reported the following factors as somewhat of a problem or a very serious problem: parents' and students' negative attitudes about vocational education (47 states); lack of understanding of the Tech-Prep concept by students, parents, employers, or the community as a whole (43 states); and lack of cooperation between academic and vocational educators (36 states). Inadequate resources at the state level was also commonly rated as a problem (30 states).

TABLE II.7

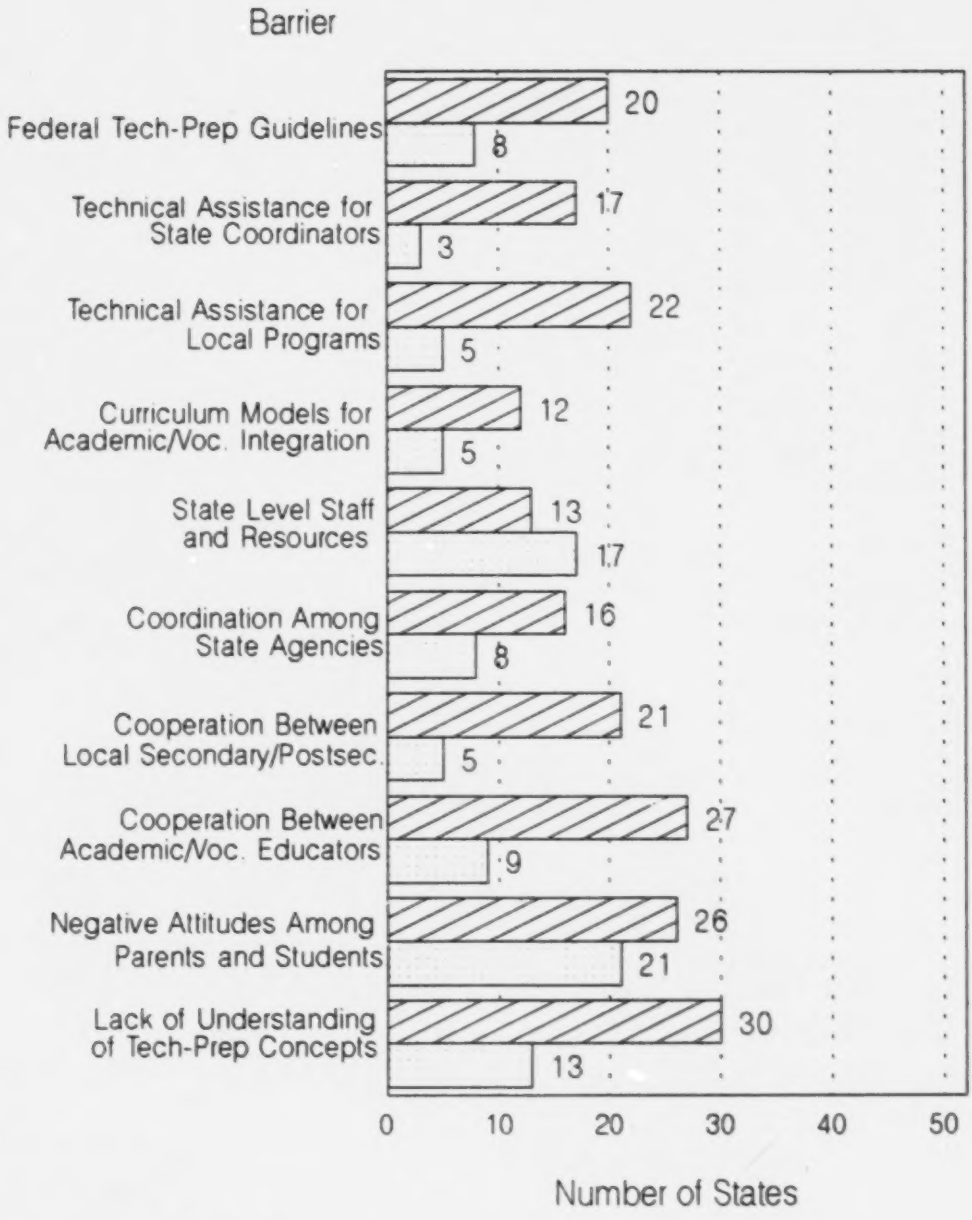
STATE COORDINATOR PERCEPTIONS OF TECH-PREP IMPLEMENTATION PROGRESS
(Number of States)

	No Progress	A Little Progress	Some Progress	Great Deal of Progress
Development of Clear Definition of Tech-Prep Objectives and Requirements	0	6	22	24
Collection and Use of Local Data on Student Outcomes	9	27	15	1
Development of Awareness and Consensus on Tech-Prep Goals Among Education Officials	1	6	25	20
Development of State-Level Coordination Among Agencies Responsible for Secondary Education, Vocation Education, Postsecondary Education	1	7	20	24
Development of State Promotion/Marketing Capacity	7	18	21	6
Development of State Capacity for Assisting Local Consortia	2	9	22	19
Creation and Operation of Local Consortia	1	1	14	36
Development of Curricula/Instruction Integrating Academic and Vocational Material	0	11	29	12
Collaboration Between Secondary and Postsecondary Institutions	0	4	26	22
Greater Attention to Needs of Students Not Bound for Four-Year Colleges	0	4	20	27
Contribution of Tech-Prep to State and/or Local Education Reform Efforts	0	5	17	30
Contribution of Tech-Prep to State and/or Local Economic Development Efforts	7	23	18	4
Involvement of Business, Industry, and Labor	1	18	24	9

SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993.

FIGURE II.4

STATE COORDINATOR PERCEPTIONS OF BARRIERS TO EFFECTIVE TECH-PREP IMPLEMENTATION



SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993.

III. THE SETTING FOR TECH-PREP INITIATIVES

Under the Tech-Prep Education Act (Title IIIE of the Perkins Amendments), state administering agencies award grants to local consortia to support the development of Tech-Prep programs. In order to receive grants, consortia must meet the definition of a consortium set forth in the legislation, but the act gives state agencies significant latitude in determining the number and types of consortia that are awarded funds. The legislation indicates only that state agencies "shall ensure an equitable distribution of assistance between urban and rural consortium participants."

As the fourth funding cycle of the Tech-Prep Education Program and the re-authorization of the Perkins Act approach, it is important to determine where consortia are being developed, how large they are, and their potential for affecting a substantial proportion of the secondary student population. This chapter examines the number of consortia receiving Title IIIE grants and the settings in which the grants are implemented. Using the national sample of fiscal year (FY) 1993 funded consortia, we describe the distribution of consortia across states, census regions, and urban, suburban, and rural locations. We then describe the size of Tech-Prep consortia and of the student populations in school districts that are included in the consortia. Several consortium characteristics, including region, metropolitan status, and size, are used to define categories of consortia for the analysis presented in subsequent chapters.

REGIONAL AND STATE DISTRIBUTION OF TECH-PREP CONSORTIA

Overall, 823 consortia were funded by Perkins Title IIIE grants for FY 1993 (Table III.1).[1] Of these consortia, 702 completed the survey questionnaire.[2] These respondents provide the basis for the analysis in this report.

Tech-Prep consortia are particularly concentrated in the South

A little less than half of the FY 1993 consortia were located in the South, as defined by census region (Figure III.1). With 46 percent of the consortia, the South had more than twice as many consortia as the West (19 percent) or Midwest (22 percent). The Northeast had the smallest proportion of FY 1993 consortia (13 percent).

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[1]The number of *consortia* funded by Title IIIE grants for FY 1993 is less than the number of Tech-Prep *grants* awarded for that period, and less than the number of grants for the same year reported by Layton and Bragg (1991), because some states made multiple awards to a single consortium. Lists received from states indicated a total number of grants virtually identical to the Layton and Bragg estimate. However, this study focuses on Tech-Prep consortia, so each consortium is treated as a single observation, even if it received multiple grants.

[2]Although 823 consortia received grants in FY 1993, the number of potential survey respondents was smaller (812), because some consortia merged with others to form larger consortia during the 1993-1994 school year, thus reducing the number of consortia that could respond to the survey in fall 1993.

TABLE III.1

NUMBER OF LOCAL TECH-PREP CONSORTIA IN FY 1993, BY STATE

State	Total State Secondary Enrollment[a]	Number of FY 1993 Funded Consortia	Consortia Responding to Survey
Alabama	199,907	30 [b]	27
Alaska	29,556	3	2
Arizona	167,331	15	15
Arkansas	122,209	13	13
California	1,354,457	65 [b]	44
Colorado	156,272	18	13
Connecticut	125,369	10	9
Delaware	27,661	1	1
District of Columbia	17,922	1	1
Florida	503,500	17	16
Georgia	312,428	62 [b]	46
Hawaii	43,495	4	4
Idaho	63,801	6	6
Illinois	486,990	31 [b]	28
Indiana	274,823	14	13
Iowa	135,744	6	5
Kansas	116,199	6	6
Kentucky	176,459	45 [b]	38
Louisiana	194,060	13	12
Maine	54,773	6	6
Maryland	186,084	16	15
Massachusetts	230,165	11	9
Michigan	427,920	38	37
Minnesota	192,461	24	18
Mississippi	127,704	14	14
Missouri	229,222	12	12
Montana	42,677	4	3
Nebraska	78,185	6	6
Nevada	54,055	3	3
New Hampshire	47,313	2	2
New Jersey	291,788	20	15
New Mexico	79,242	13	10
New York	713,658	28	26
North Carolina	302,825	44	42
North Dakota	33,737	1	1
Ohio	531,684	13	13
Oklahoma	155,192	10	10
Oregon	138,109	20	7
Pennsylvania	476,198	21	18
Rhode Island	37,694	1	1

TABLE III.1 *(continued)*

State	Total State Secondary Enrollment[a]	Number of FY 1993 Funded Consortia	Consortia Responding to Survey
South Carolina	171,513	16	16
South Dakota	35,555	4	4
Tennessee	230,662	14	14
Texas	888,937	25	25
Utah	125,578	9	8
Vermont	23,844	9	4
Virginia	271,181	27	21
Washington	236,546	18	15
West Virginia	95,429	11	11
Wisconsin	231,732	16	12
Wyoming	28,082	5	3
Puerto Rico	163,652	1	1
Virgin Islands	5,284	1	1
U.S. Total	**11,446,864**	**823**	**702**

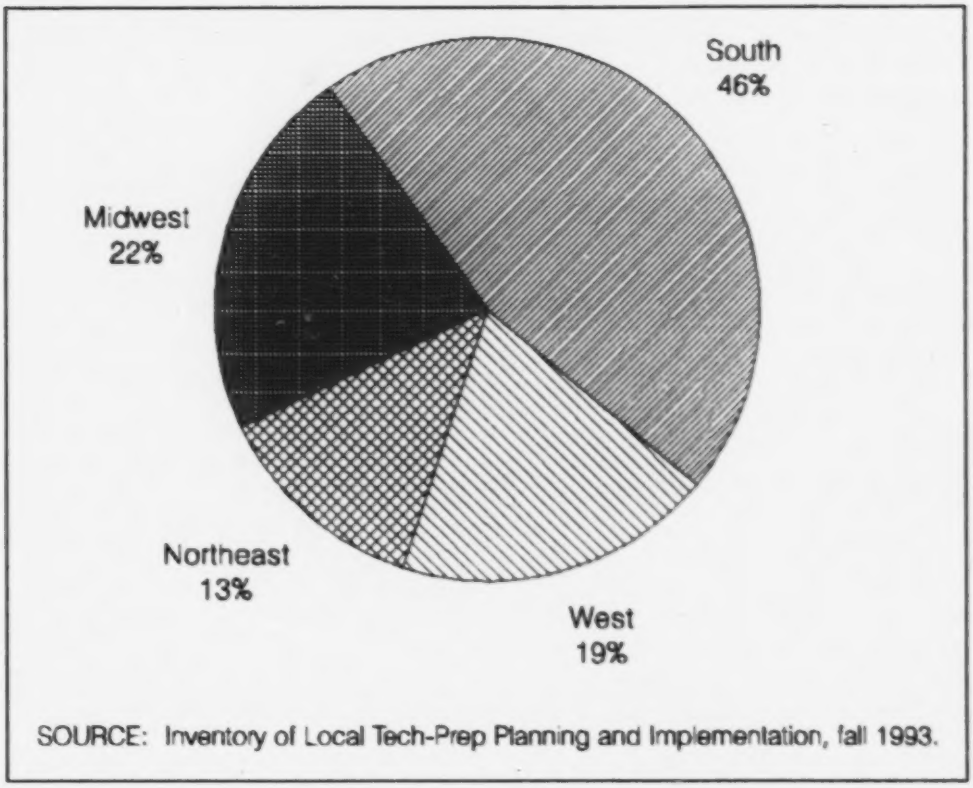
SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993; ED-INFO.

[a]Based on most recent information from the National Center for Education Statistics (NCES)--for school year 1991-1992, available from ED-INFO.

[b]The number of potential respondents to the survey was actually smaller in these states, primarily because multiple consortia merged or were consolidated during FY 1993, so that fewer consortia were in existence when the survey was administered in early FY 1994. The difference between the number of FY 1993 funded consortia and the number expected to respond in those states ranged from one to four consortia.

FIGURE III.1

REGIONAL DISTRIBUTION OF TECH-PREP CONSORTIA



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

The number of grantees in each state and the size of the student population show some correlation.

The number of consortia in each state--one possible indicator of Tech-Prep "activity"--varies with the number of secondary students and the amount of Title IIIE funds awarded to a state, which is based largely on student enrollment (Table III.1). However, this general relationship has many exceptions. For example, although Kentucky and South Carolina have approximately 170,000 secondary students each and receive similar amounts of Title IIIE funding from the U.S. Department of Education (ED), the two states had very different numbers of funded consortia in FY 1993--45 in Kentucky and 16 in South Carolina. Although Florida had larger secondary enrollments than Illinois, it awarded only 17 local consortium grants that included FY 1993, compared with 31 awarded by Illinois.

Differences in the number of states' Tech-Prep consortia also seem related, in part, to explicit state decisions about funding practices. Some large states, like Texas and Michigan, have encouraged the organization of all or most secondary districts and community colleges into Tech-Prep consortia and have funded the majority of these consortia. Other states appear to be very selective in determining how many and which partnerships of districts and community colleges receive Title IIIE funding. These states tend to award large grants to fewer consortia, such as

those designated as pilot projects or those in a more advanced stage of development, as in Arkansas. Kentucky is using Tech-Prep as one vehicle for statewide education reform efforts, which may have influenced the state agency to award a large number of grants relative to the size of its student population.

GEOGRAPHIC LOCATION AND SIZE OF TECH-PREP CONSORTIA

Both the urbanicity and size of consortia are likely to have an impact on some aspects of Tech-Prep development. Urban consortia may serve Tech-Prep students with different needs and interests than those of students in suburban or rural areas. Relative to larger consortia that involve many districts and postsecondary institutions, smaller consortia may find it easier to develop close working relationships among members.

Urban districts are most likely to be involved in Tech-Prep

Compared with suburban or rural districts, a substantially higher percentage of urban districts are included in Tech-Prep consortia.[3] Of all secondary districts classified as urban, 69 percent belong to Tech-Prep consortia, based on survey responses. Approximately 47 percent of suburban school districts and 40 percent of rural districts are members of a Tech-Prep consortium.[4]

Relatively few consortia are located primarily within urban areas

About half of the FY 1993 consortia (46 percent) were located primarily in suburban locales. Another 42 percent of consortia were found in rural areas. Consortia located primarily in urban communities represented only 12 percent of all FY 1993 funded consortia (Figure III.2).[5]

---

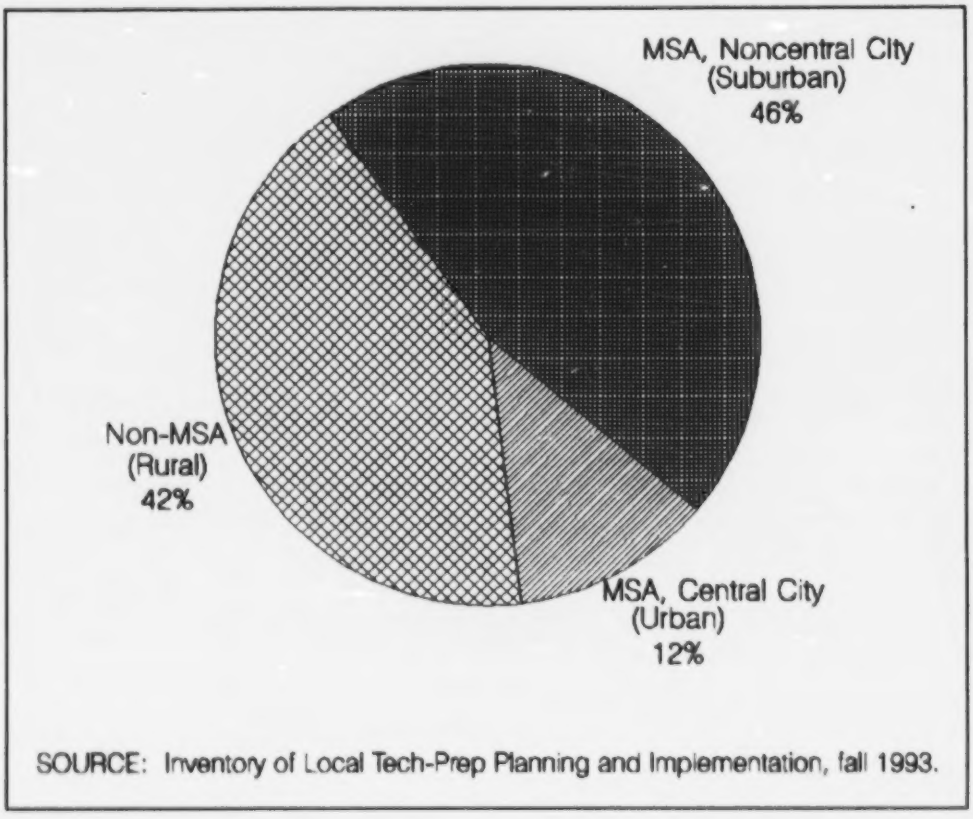
[3]Urbanicity was determined on the basis of the standard Metropolitan Statistical Area (MSA) code classification available in the National Center for Education Statistics (NCES) data obtained from ED-INFO. Each secondary district in the ED-INFO database had a designated metropolitan status code based on the MSA codes. In this report, we refer to central city MSA districts as urban districts, to non-central city MSA districts as suburban districts, and to non-MSA districts as rural districts.

[4]These numbers confirm recent estimates of district participation in Tech-Prep, as reported by the National Assessment of Vocational Education (NAVE) (1994).

[5]Estimates of consortium urbanicity may contain some imprecision, because many consortia include secondary school districts that span urban, suburban, and rural areas. As noted in footnote 3, consortia were designated as urban, suburban, or rural on the basis of the NCES metropolitan status code reported in the ED-INFO data. In consortia with multiple districts, we derived a "mean urbanicity code" by weighting each district's metropolitan status code by its total secondary enrollment.

FIGURE III.2

METROPOLITAN STATUS OF TECH-PREP CONSORTIA



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

These figures might appear to conflict with the finding that urban districts are more likely than suburban or rural districts to participate in Tech-Prep. However, the two statistics address different questions. The first answers the question, "What percentage of urban districts are involved in Tech-Prep?" The second answers, "Of the FY 1993 funded Tech-Prep consortia, what percentage are urban?" Because urban areas have many fewer districts relative to suburban or rural areas, they will still be underrepresented in comparisons involving all consortia, even if urban districts are more likely to become involved in Tech-Prep.

The most common consortium configuration is one district and one postsecondary institution

The size of FY 1993 consortia--defined in this chapter as the number of secondary districts and postsecondary institutions--varied considerably (Table III.2). In the most common pattern--observed in about 15 percent of all cases--the consortium includes one secondary school district

TABLE III.2

CONSORTIUM SIZES AND CONFIGURATIONS
(Number of Consortia)

Number of Secondary Districts	Number of Postsecondary Institutions[a]						
	1	2	3	4	5-10	>10	Total
1	103	41	23	19	12	1	201
2	30	11	3	1	5	2	52
3	23	6	7	3	7	0	46
4	25	8	4	2	1	1	41
5-10	88	39	29	9	24	3	193
11-20	39	24	15	10	10	5	104
21+	14	13	6	6	21	4	65
Total	**322**	**142**	**87**	**50**	**80**	**16**	**702**

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

[a]Includes community and technical colleges, four-year colleges and universities, proprietary schools, and registered apprenticeship programs.

and one postsecondary institution, almost always a community, junior, or technical college.[6] Approximately 13 percent of consortia included between 5 and 10 secondary districts and 1 postsecondary institution.

Most consortia include one or two postsecondary partners

More than 300 of the 702 FY 1993 consortia (46 percent) included only one postsecondary institution (Table III.2). Another 20 percent included two postsecondary institutions. Only 96 consortia, or 12 percent, had five or more postsecondary institutions as members.

Many consortia include a large number of secondary districts

At the time of the fall 1993 surveys, about half of the consortia included five or more secondary school districts as consortium members (Table III.2). Although the most common size grouping of secondary and postsecondary partners is that of one school district and one community college, consortia with one secondary school district represented only 28 percent of all FY 1993 consortia.

It is important to note that, although many consortia reported having a large number of districts as members, these districts are likely to be at varying stages of Tech-Prep program development. The survey data reported in later chapters indicate that many consortia are still in a pilot phase, in which some components have been implemented in a limited number of member districts or schools.

The size of consortia varies by census regions, state, and urbanicity

Consortia in the Midwest are likely to be quite large; in fall 1993, almost 30 percent had more than 25 high schools, vocational centers, and postsecondary institutions, compared with only 7 to 12 percent for consortia in other regions. The South has the highest proportion of small consortia (those with fewer than five secondary and postsecondary institutions).

Large consortia are concentrated in a few states. California, Indiana, Michigan, Pennsylvania, Wisconsin, and, particularly, Texas, have consortia with large numbers of both secondary districts and postsecondary institutions. A significant proportion of consortia in Maine and Missouri are also relatively large; 4 of 6 consortia in Maine and 6 of 12 in Missouri reported having more than 20 school districts as consortium members. The concentration of large consortia in some states probably reflects state decisions about how to organize Tech-Prep initiatives statewide.

Suburban consortia are larger than either urban or rural consortia. Twenty-one percent of suburban consortia have more than 25 secondary and postsecondary institutions, compared with only 9 percent of consortia in urban areas, and 7 percent in rural areas. Rural consortia are the smallest (Figure III.3).

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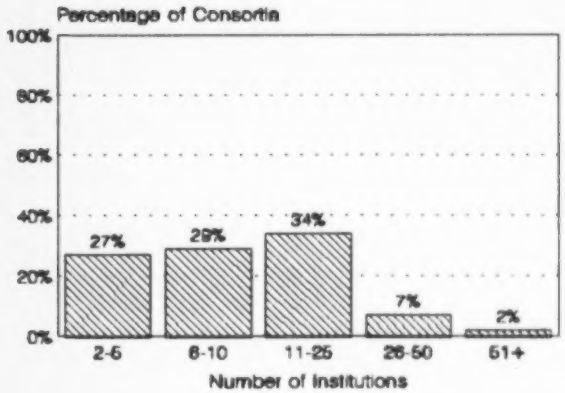
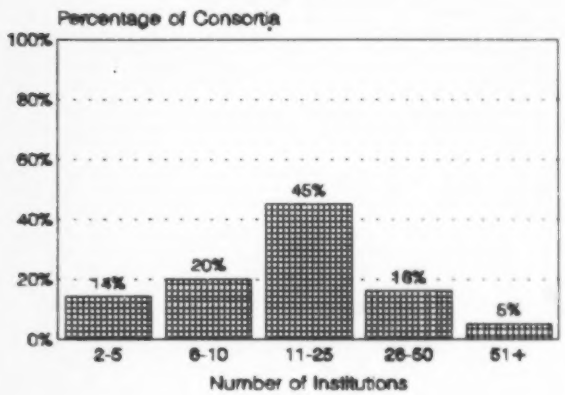
[6]In this context, postsecondary institutions include community, junior, and technical colleges; four-year colleges and universities; proprietary schools; and registered apprenticeship programs.

FIGURE III.3

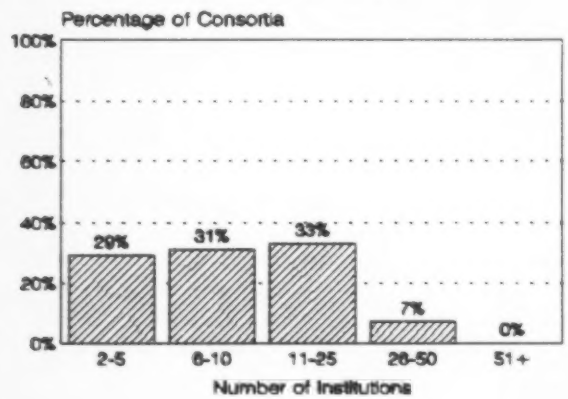
SIZE OF TECH-PREP CONSORTIA, BY METROPOLITAN STATUS



Urban



Suburban



Rural

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

POTENTIAL STUDENT INVOLVEMENT IN TECH-PREP

Although the number of consortia with Title IIIE funding is one indicator of the potential influence of Tech-Prep in a state, a better measure is the proportion of students who might be affected by these initiatives. Some states awarding small numbers of Title IIIE grants relative to their secondary enrollments may be disbursing the grants to consortia that include many districts and, therefore, many students. Only by considering both the number of consortia and their size (primarily the number of districts involved) can we project how many students might benefit from Tech-Prep, if it were fully implemented in every school in every district of each consortium.

To estimate the extent of potential participation in Tech-Prep, we calculated the percentage of the total secondary student population that was included in Tech-Prep districts. A Tech-Prep district is defined as any district included as a member of a consortium receiving a Title IIIE grant.

Close to one-half of all U.S. school districts belong to a Tech-Prep consortium

At the time of the fall 1993 survey, a total of 5,328 districts were members of Tech-Prep consortia. These districts represent 44 percent of the approximately 12,000 secondary districts in the United States. (Some of these districts, it should be noted, were included in more than one Tech-Prep consortium.)

Almost two-thirds of U.S. secondary students are enrolled in a Tech-Prep consortium district

High school enrollment in Tech-Prep districts accounts for approximately 60 percent of all secondary enrollment in the United States. This proportion is similar for 9th, 10th, 11th, and 12th grades separately, as well as for grades 9 through 12 as a whole.

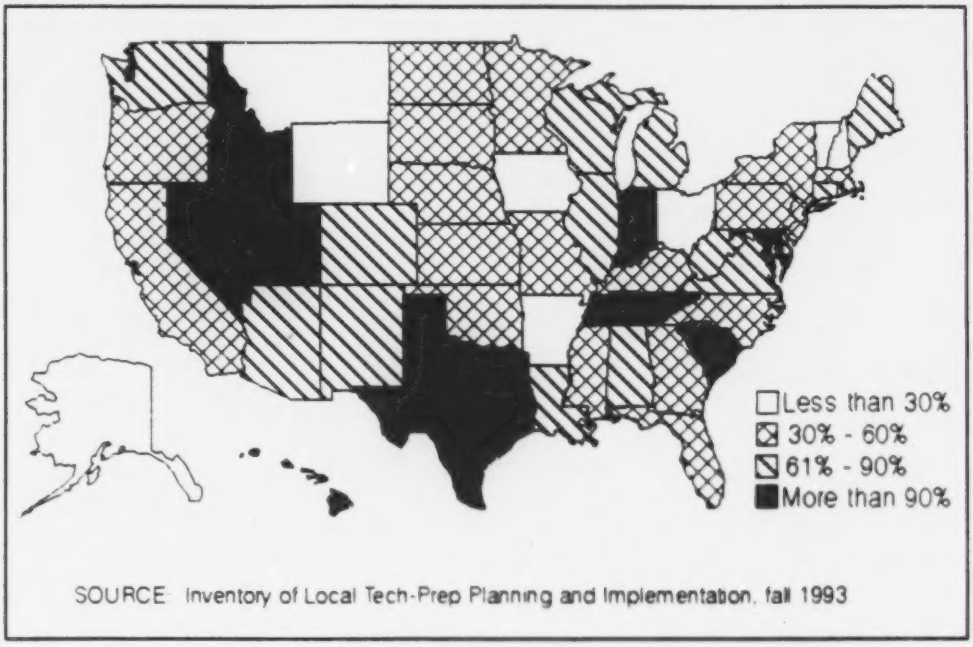
Districts in Tech-Prep consortia are large relative to those not in consortia. Although only 43 percent of districts are members of Tech-Prep consortia, they account for 62 percent of all secondary enrollments. This result is consistent with numbers reported in the recent NAVE study of Tech-Prep (1994), which indicated that districts involved in Tech-Prep are larger than the national average.

Tech-Prep "coverage" varies significantly by state

The percentage of secondary students included in Tech-Prep consortia in each state, based on districts identified by survey respondents, ranges from just over 9 percent to 100 percent (Figure III.4). The extent of this coverage depends, in part, on both the number of grants and the size of the consortia awarded grants. For example, Arizona and Arkansas funded a similar number of consortia for FY 1993--13 and 15, respectively--but the Arkansas consortia have fewer districts, and they include less than 30 percent of the secondary student population in the state, compared with almost 90 percent in Arizona.

FIGURE III.4

PERCENTAGE OF SECONDARY STUDENT POPULATION INCLUDED IN RESPONDENT TECH-PREP CONSORTIA, BY STATE



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993

In states with a survey response rate of less than 100 percent, student coverage is underestimated. We were not able to identify districts and count students for nonresponding consortia. The estimates for states such as Vermont, in which only four of nine consortia completed a questionnaire, or Oregon, which had only a 35 percent response rate, are therefore particularly inaccurate. Twenty-eight other states had less than a 100 percent response rate, although only 10 had less than an 80 percent response (see Table A.1).

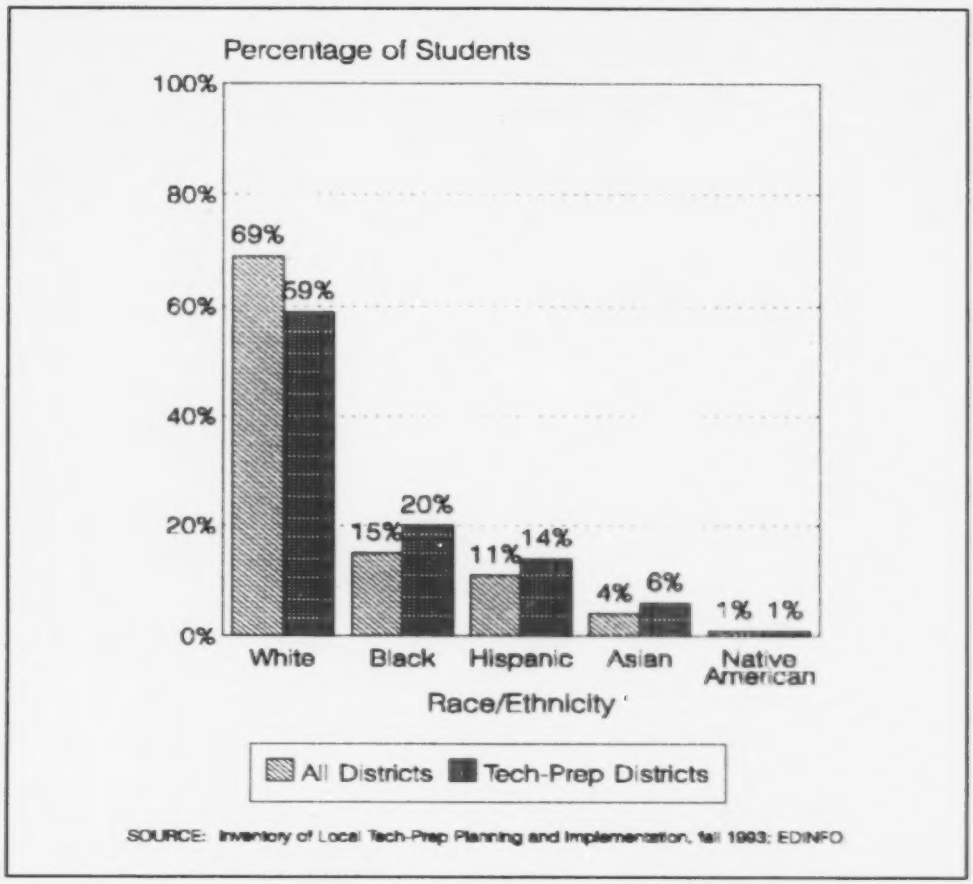
These estimates of Tech-Prep coverage do not in any way represent actual participation. Not all students in a Tech-Prep district are likely to participate in the program, even if it were fully implemented. States, districts, and individual schools vary in their determination of the target group for Tech-Prep, and in how they define who is counted as in a Tech-Prep program. In some districts, only a small proportion of secondary students might be participating in a fully implemented Tech-prep program, whereas in others, Tech-Prep may be designed to include a substantial proportion of the high school population. Many consortia are still planning Tech-Prep or conducting pilot implementation in some schools or districts.

The racial/ethnic distribution of students in Tech-Prep districts is somewhat different from the distribution of the total U.S. secondary school population

Relative to U.S. districts overall, Tech-Prep districts have a lower percentage of white students and higher percentages of African American, Hispanic, and Asian students (Figure III.5). This difference is probably due to the fact that urban districts, with substantial minority populations, are more likely than suburban or rural districts to be in Tech-Prep consortia. The Tech-Prep Education Act specifies that state agencies should give special consideration in awarding Title IIIE grants to consortia that "address effectively the issues of dropout prevention and re-entry and the needs of minority youth." The greater representation of minority youth in Tech-Prep districts may to some extent reflect conscious state decisions in response to this federal guidance.

FIGURE III.5

PERCENTAGE OF SECONDARY STUDENTS IN ALL U.S. DISTRICTS AND IN TECH-PREP DISTRICTS, BY RACE/ETHNICITY



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993; EDINFO

IV. THE ORGANIZATION, LEADERSHIP, AND RESOURCES OF TECH-PREP CONSORTIA

The concept of an organizational partnership as a necessary structure for Tech-Prep implementation is clearly articulated in the Tech-Prep Education Act. The legislation stipulates that Title IIIE grants be awarded to consortia composed of educational agencies serving secondary students and postsecondary institutions. Consortium members can include local or intermediate educational agencies, area vocational education schools, secondary schools funded by the Bureau of Indian Affairs, nonprofit institutions of higher education conferring two-year associate degrees or certificates or offering two-year apprenticeship programs, and some types of postsecondary proprietary schools. The act also instructs state administering agencies to give special consideration to grant applications from consortia that "are developed in consultation with business, industry, and labor unions."

In this chapter, we discuss the composition and administration of Tech-Prep consortia. We first explore the definition of consortium membership, using the results of the survey data. In the second section, we describe the range of agencies and institutions that are members of Tech-Prep consortia. In the third, we focus on business, industry, and labor involvement in Tech-Prep. We briefly discuss consortium leadership and resources in the fourth and fifth sections, respectively.

DEFINING MEMBERSHIP IN A CONSORTIUM

What is a consortium? The Tech-Prep Education Act promotes the formation of a team of one or more secondary districts (regular or vocational) working together with one or more colleges, universities, or proprietary schools that grant two-year degrees or certificates. The close cooperation and working relationships among consortium members that would appear necessary to achieve Tech-Prep objectives might be expected to affect the structure of consortia. Although the legislation does not mandate particular structures, we expected to find secondary districts and postsecondary institutions linked in cohesive and distinct groups--specifically, that each district and college would become part of a single consortium working as a unit to create a locally accessible set of programs linking high school and postsecondary study.

The Tech-Prep legislation, however, offers no definition of "membership" in a consortium, or the extent of participation expected of the institutions that form a consortium. Although the survey asked local consortium coordinators to list institutions and organizations that are "actively involved in planning or implementing aspects of Tech-Prep," coordinators undoubtedly interpreted this guidance differently. For example, some consortia may have counted postsecondary institutions as members only if they have or are developing articulation agreements with member districts. In other consortia, all area postsecondary institutions may be designated members, whatever their level of active involvement.

Data from the fall 1993 survey and informal discussions with some state Tech-Prep coordinators suggest that consortia can be relatively loose groupings of institutions. Such institutional arrangements, explored in more detail in the remainder of this section, may in some ways increase students' educational options but at the same time contribute to difficulties in reporting on student participation and activities in Tech-Prep programs.

Multiple consortia may share members

Some secondary districts belong to more than one consortium. Over 300 secondary districts involved in Tech-Prep in 1993 were identified as members of more than one consortium. More than 30 states contained some districts that were counted in at least two consortia. Overlap in consortium membership is relatively common in states that are small geographically, such as Connecticut, or that have a large community college system, such as California. In both situations, school districts, particularly in urban areas, are likely to be in relatively close proximity to, and to develop links, with several postsecondary institutions.

This arrangement is fairly widespread. Approximately 200 consortia across 30 states (28 percent of those responding to the survey) contain districts that are counted as members of at least one other consortium. In most of these consortia, only one district is cited as a member by another consortium. However, the shared districts often represent a significant proportion of the total number of districts identified as members of the consortium, particularly in Alabama, Georgia, New York, North Carolina, and West Virginia. In other states, the overlap of consortia appears to be marginal and represents only a small fraction of the total number of districts in each consortium.

Consortia also share postsecondary institutions. Some secondary districts go outside their consortium to develop articulation agreements with colleges in other consortia. About 4 percent of all consortia report articulation agreements involving more postsecondary institutions than were identified as members of the consortium.[1] Twenty percent of consortia have articulated with more postsecondary institutions than their member community colleges. This latter figure may more accurately represent the extent to which consortium districts form links with institutions beyond their member postsecondary partners, since other research suggests that articulation with four-year colleges, proprietary schools, and apprenticeship programs is not widespread.

Discussion with state Tech-Prep coordinators suggests that, in the initial years of Tech-Prep, some colleges worked separately with multiple groups of districts, particularly as districts began Tech-Prep development at different times. However, several state coordinators reported imposing new rules for Tech-Prep funding within the past year that require each postsecondary institution to join only one consortium. In part, states would like to minimize the involvement of postsecondary institutions in multiple consortia because colleges are often the fiscal agent for Tech-Prep grants. This role becomes more complicated if the college must allocate multiple grants to different sets of partners, and must account for its own use of resources under these different funding units.

Working with institutions in other consortia is often useful

Discussions with staff from the in-depth study sites and with state Tech-Prep coordinators suggest that, in many cases, overlap in consortium membership is useful. Some school districts and vocational centers develop articulation agreements with multiple postsecondary institutions,

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[1]The total number of postsecondary institutions in each consortium is the sum of the reported number of community, junior, and technical colleges; four-year colleges or universities; postsecondary proprietary institutions; and postsecondary apprenticeship programs that were identified as consortium members.

regardless of whether they are all part of a single formal consortium, in order to overcome limitations in the program offerings of any individual community college, thereby offering students a broader choice of postsecondary options. If consortium membership is based primarily on articulation, a district often will join more than one consortium in order to gain access to additional postsecondary partners. Other districts will maintain membership in one consortium, but will develop articulation agreements with postsecondary institutions outside the formal boundaries of the consortium. These diverse patterns underscore the fact that "membership" in a consortium may be defined in quite different ways.

Overlapping consortium membership may complicate efforts to document student participation and outcomes accurately

If consortia are the reporting unit for student outcomes, then inclusion of districts or postsecondary institutions in more than one consortium can lead to inaccurate estimates of Tech-Prep participation. Districts that can identify and count Tech-Prep students but that belong to multiple consortia might report the same enrollment numbers to several consortium coordinators. Community colleges that serve Tech-Prep students from more than one consortium may lack the ability to distinguish accurately between students from the individual consortia, and therefore report the combined total to each consortium coordinator.

Distortions due to such double counting in the estimates from the 1993 survey are probably small, however. Fewer than one-third of the consortia that include districts participating in multiple consortia reported that they were able to count Tech-Prep enrollments. An even smaller proportion (10 percent) could report the number of Tech-Prep high school graduates.

COMPOSITION OF TECH-PREP CONSORTIA

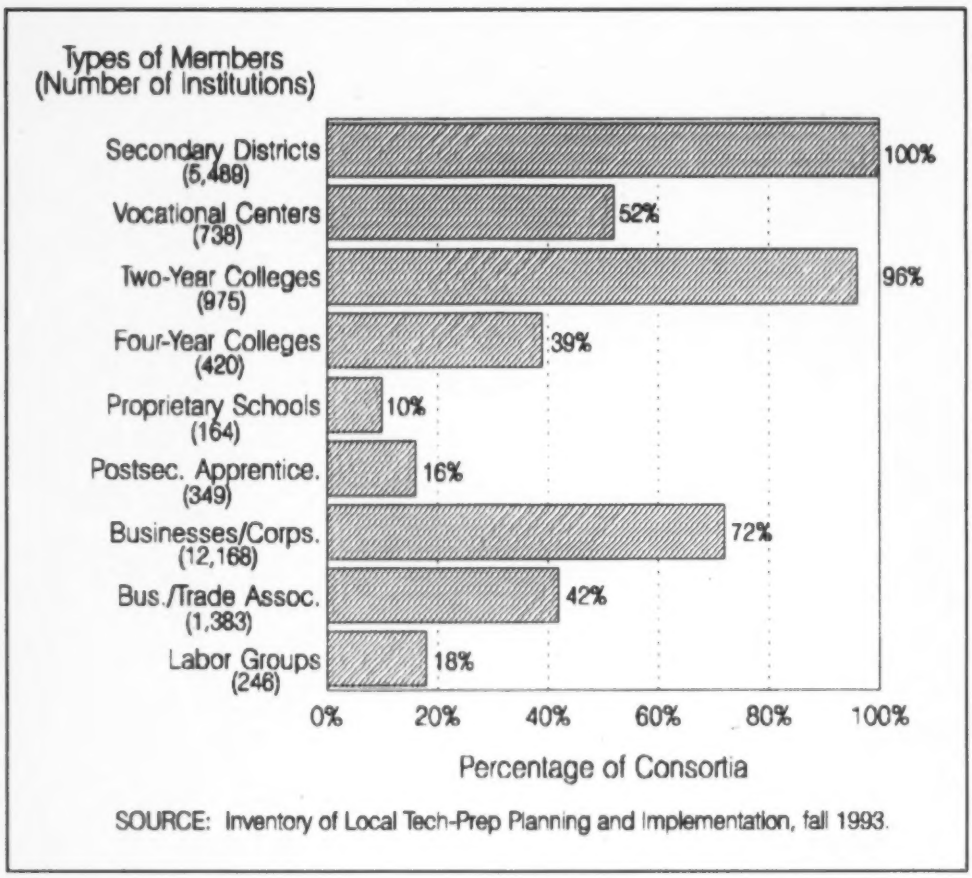
Although the Tech-Prep Education Act specifies the minimum definition necessary for a consortium to receive Title IIIE funding, membership across consortia varies considerably. Consortia differ by the *types* of secondary and postsecondary entities that are included. They also differ in the extent to which consortium coordinators view business, industry, and labor groups as active members in the consortium's efforts.

Secondary districts are represented in all Tech-Prep consortia

It is not surprising that virtually all of the consortia reported including a secondary education agency, as these agencies were cited in the Perkins Act as a primary secondary partner required for Title IIIE funding (Figure IV.1). The number of secondary districts in consortia ranged from 1 to 64; the average was 7.8 districts. The average number of schools (10.8) was slightly higher than the number of districts, because many districts have more than one school. Suburban consortia had the highest average number of member districts, and urban consortia had the lowest.

FIGURE IV.1

MEMBERSHIP IN TECH-PREP CONSORTIA



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Slightly more than half of the consortia included vocational districts or area vocational centers; suburban consortia were more likely than urban consortia to include these institutions as members. Consortia located in the Western census region were much less likely than those in other census regions to include vocational districts or centers.

Two-year colleges are the primary postsecondary partners

Consortia include different configurations of postsecondary partners. In fall 1993, slightly less than half involved more than one type of postsecondary institution. Community, junior, or technical colleges were reported as members of virtually all consortia (Figure IV.1). Only four percent of consortia did not include a two-year college as a postsecondary partner; however, these consortia included four-year colleges or proprietary schools.

Almost 40 percent of all consortia reported having at least one four-year college or university as a member. Small percentages of consortia included postsecondary proprietary schools (10 percent) or postsecondary apprenticeship programs (16 percent).[2]

Postsecondary membership varies with geographic location. Suburban consortia and those located in the Northeast were most likely to include proprietary schools. Rural consortia were least likely to include postsecondary apprenticeship programs and four-year institutions. However, consortia in all regions of the country were equally likely to include four-year colleges as members.

Business, industry, and labor are relatively widely viewed as members of Tech-Prep consortia

Businesses and labor groups are widely identified as consortium members, even though the Tech-Prep legislation does not require that they be included in local consortia. In the fall of 1993, almost three-fourths of the consortia reported including businesses and corporations, 42 percent included business/industry or trade associations, and 18 percent included individual labor groups or unions (Figure IV.1).

The likelihood of business, industry, or labor group membership did not vary much by census region, but did vary by metropolitan status. Rural consortia were least likely, and urban consortia most likely, to include these groups as members.

The year in which a consortium received its first Title IIIE grant does not affect the likelihood of having business, industry, or labor groups as members. We might have expected consortia to focus initially on developing relationships among educational agencies and institutions, and to delay efforts to include businesses until later in the development stage. Of course, business, industry, and labor input at earlier stages can be extremely important in defining competencies and outcomes, reviewing curricula, assisting in promotion and staff development, and other activities. The survey findings suggest that consortia commonly perceive the benefit of early participation by these groups.

ROLE OF BUSINESS, INDUSTRY, AND LABOR IN TECH-PREP

Business, industry, and labor involvement in the development of Tech-Prep was given some prominence by the Perkins Tech-Prep Education Act in 1990. The act encouraged educational agencies and institutions to consult with these groups, but did not mandate their participation as a requirement for funding or specify any particular role for them in Tech-Prep planning and implementation. With the passage of the School-to-Work Opportunities Act, signed by President Clinton in May 1994, however, many Tech-Prep consortia may attempt to solidify and expand business and industry support for their school efforts. We expect to observe changes in this aspect of Tech-Prep during the next three years of the survey.

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[2]The national Tech-Prep survey asked coordinators to report the number of postsecondary apprenticeship *programs* involved in the consortium, rather than the number of institutions that are sponsoring these programs. Because many apprenticeship programs are operated by community colleges, there may be some overlap between the estimate of apprenticeship programs and of community colleges.

The general model promoted by the School-to-Work Opportunities Act, in which federal grants are awarded to states and local partnerships to promote a system of integrated school- and work-based learning programs, requires substantial commitment from business, industry, and labor. Programs receiving school-to-work grants must ensure that students receive "a planned program of job training and work experience" that is related to their "career majors" in school. Localities applying for these grants must demonstrate, in their grant applications, strong evidence of employer involvement and must clarify the specific roles of business, industry, and labor.

In anticipation that the School-to-Work Opportunities Act would be enacted, and in recognition of federal government interest in the roles of business, industry, and labor in preparing youth for transitions to productive careers, we included survey questions about the involvement of these groups in Tech-Prep development. Specifically, we asked about the types of support that individual businesses and corporations, business or trade associations, and labor organizations gave each consortium in FY 1993. The survey listed 18 categories of support and gave respondents the opportunity to provide other answers as well. The responses yield an overall impression of the types of contributions made by these groups to Tech-Prep, but are not a measure of the extent of their involvement.[3]

Most consortia receive support from the private sector or labor groups

Business and labor groups appear to play a role in many Tech-Prep consortia. More than three-fourths of the consortia reported receiving some type of support from individual businesses or corporations, business/industry or trade associations, or labor organizations in FY 1993 (Figure IV.2). One hundred seventy consortia (25 percent) reported receiving no assistance from these groups, yet about half of these 170 consortia reported including businesses, associations, or labor unions as consortium members. This pattern may indicate that in some consortia these organizations are represented by individuals sitting on governing boards or steering committees, but the organizations themselves are not involved any further.

Established consortia are more likely than newer consortia to be receiving active support from business, industry, and labor. About 80 percent of consortia that received their first Title IIIE grant in FY 1992 reported receiving support, compared with 60 percent of consortia that received their first grant in FY 1993.

The main contribution of business, industry, and labor is assisting Tech-Prep staff to develop the program

Business, industry, and labor can assist Tech-Prep development in a number of ways. These groups can (1) work with students, by providing facility tours, job-shadowing opportunities, or part-time employment; (2) work with staff, for example, on curriculum development and review, marketing, or staff development; and (3) provide material resources, such as student scholarships or classroom equipment.

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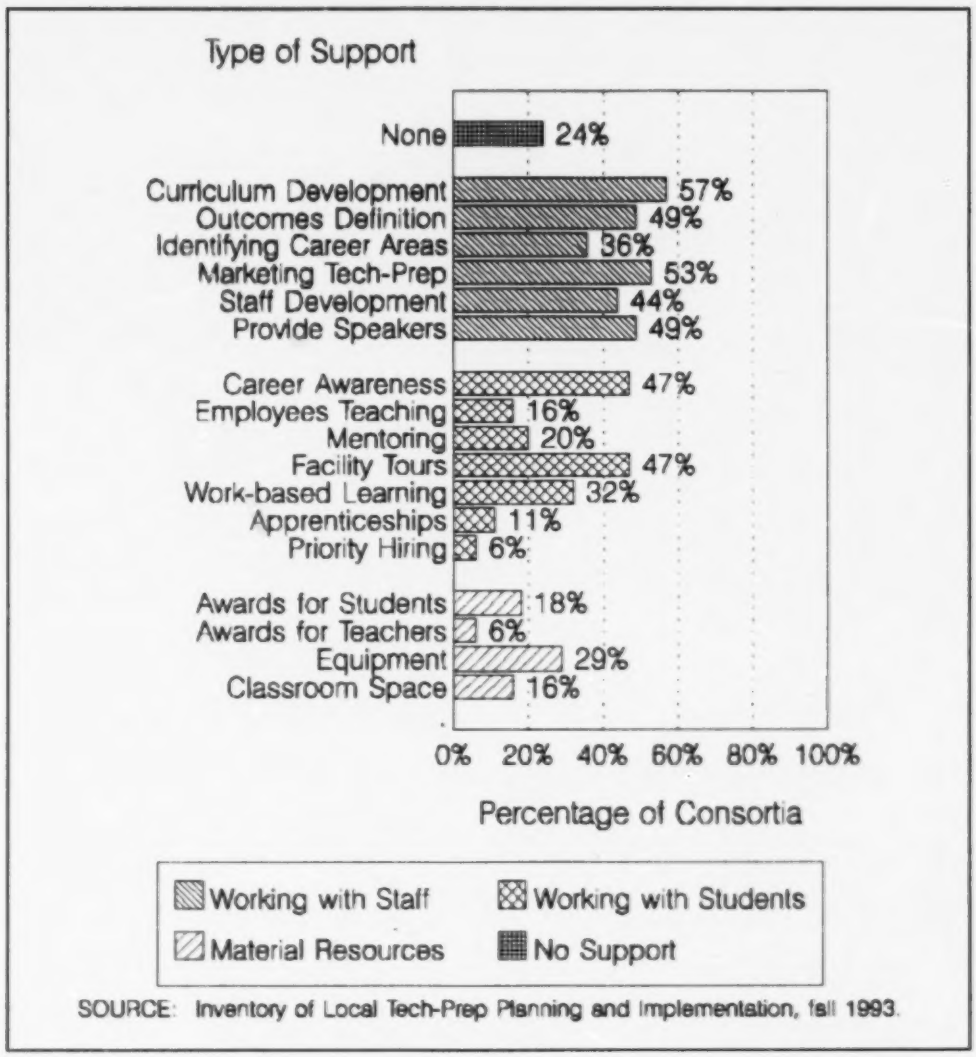
[3]These organizations may have focused these reported activities only on some schools or districts in a consortium.

Consortia reported that business, industry, and labor work most often with Tech-Prep staff on program development (Figure IV.2). Almost 60 percent of all consortia reported receiving assistance from business and labor in developing curricula, including identifying competencies, listing relevant tasks and objectives, or creating laboratory or other contextual learning activities. About half reported that these groups helped to define program outcomes, or to promote and market Tech-Prep. In 16 percent of all consortia, representatives from these groups taught some classes in consortium schools.

FIGURE IV.2

TYPES OF SUPPORT RECEIVED FROM BUSINESSES, CORPORATIONS, TRADE ASSOCIATIONS, AND LABOR ORGANIZATIONS



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Work-based learning opportunities are not currently a major area of business, industry, and labor Tech-Prep support

Approximately one-third of all Tech-Prep consortia reported that business and industry provided work-based learning opportunities for students in FY 1993. These reported opportunities for work-based learning may include a variety of activities, because the questionnaire did not define the term. Therefore, the data should not be interpreted as a measure of the incidence of work-based learning as it is promoted in the School-to-Work Opportunities Act--that is, a "planned program of job training and work experience."

In many consortia, area businesses offer Tech-Prep students workplace exposure activities

Slightly fewer than half of the consortia reported that businesses and corporations provided career awareness opportunities for students, or arranged for student tours of their facilities. Students in 20 percent of consortia had access to a workplace mentor.

Material support from business, industry, and labor is not very prevalent

Business, industry, and labor do not seem to consider provision of material resources to be a major method of support for Tech-Prep development, relative to other types. In FY 1993, fewer than one-third of the consortia reported receiving equipment or other materials from these groups, and fewer than 20 percent received physical space for classrooms or special activities. In a few consortia, business and industry gave awards and scholarships to students or teachers.

CONSORTIUM LEADERSHIP

The existence of a consortium board, and the board's leadership could influence Tech-Prep implementation. A governing board can facilitate communication among member districts, schools, and postsecondary institutions; review problems and issues; formulate new ideas; and make consortium-wide policy decisions. These tasks are likely to be much more difficult to accomplish without a board and effective leadership.

The national survey contained several questions on governance structure of Tech-Prep consortia as of fall 1993. It asked about the existence and composition of a governing board responsible for Tech-Prep policymaking, and the date on which the board was established. If a board chairperson had been designated, it also asked consortium coordinators to identify the type of organization that the chairperson was from.

Most consortia have a governing board to guide Tech-Prep development

More than 90 percent of consortia have a governing board or equivalent policy/decision-making body that is responsible for Tech-Prep planning and implementation. Not all of these boards focus exclusively on Tech-Prep, however. Evidence from the in-depth study sites indicates that some may be regular district boards or councils that oversee all secondary education issues, including, but not limited to, Tech-Prep. Others may be regional workforce preparation committees that explicitly include representatives of schools, employers, the chamber of

commerce, Private Industry Council, and other organizations. About five percent of the boards were established more than four years before the consortium's first Title IIIE grant was received; some were established 10 or more years earlier. Given their early establishment, these boards most likely oversee educational programs or reform initiatives beyond Tech-Prep.

Most governing boards are formed shortly before Title IIIE grants are received

Establishing or designating a governing board that ultimately will be responsible for Tech-Prep may be the first step in preparing a grant application for Tech-Prep funding. Eighty-six percent of the consortia with governing boards had established these boards before receiving their first Title IIIE grant; more than 80 percent of these had done so within the two years before grant receipt.

Secondary and postsecondary institutions are represented about equally on governing boards

Similarly high proportions of consortia reported having secondary staff and postsecondary staff on their Tech-Prep governing boards (Figure IV.3).[4] The similar likelihood of representation of secondary and postsecondary administrators and teachers may be as much a reflection of the way in which the consortium coordinator position or fiscal agent was designated as of the levels of actual involvement in Tech-Prep. Some states chose postsecondary institutions as the fiscal agent for consortium Title IIIE funding, both to ensure equitable treatment for all school districts involved in the consortium and because colleges often have more flexibility than secondary districts in disbursing funds. In other states, the fiscal agent or consortium coordinator was identified at the secondary level. Virtually all of the respondents to the survey were identified as the consortium coordinators and, most often, were also the fiscal agent for federal funding. About half of the respondents were based in postsecondary institutions, and about half in secondary agencies or schools.

Business and industry are well represented on Tech-Prep governing boards

Representatives of area businesses and corporations serve on more consortium boards than do teachers or counselors (Figure IV.3). Approximately 60 percent of the consortia with governing boards had private sector representatives on their boards; only about 40 percent had vocational teachers on their board.

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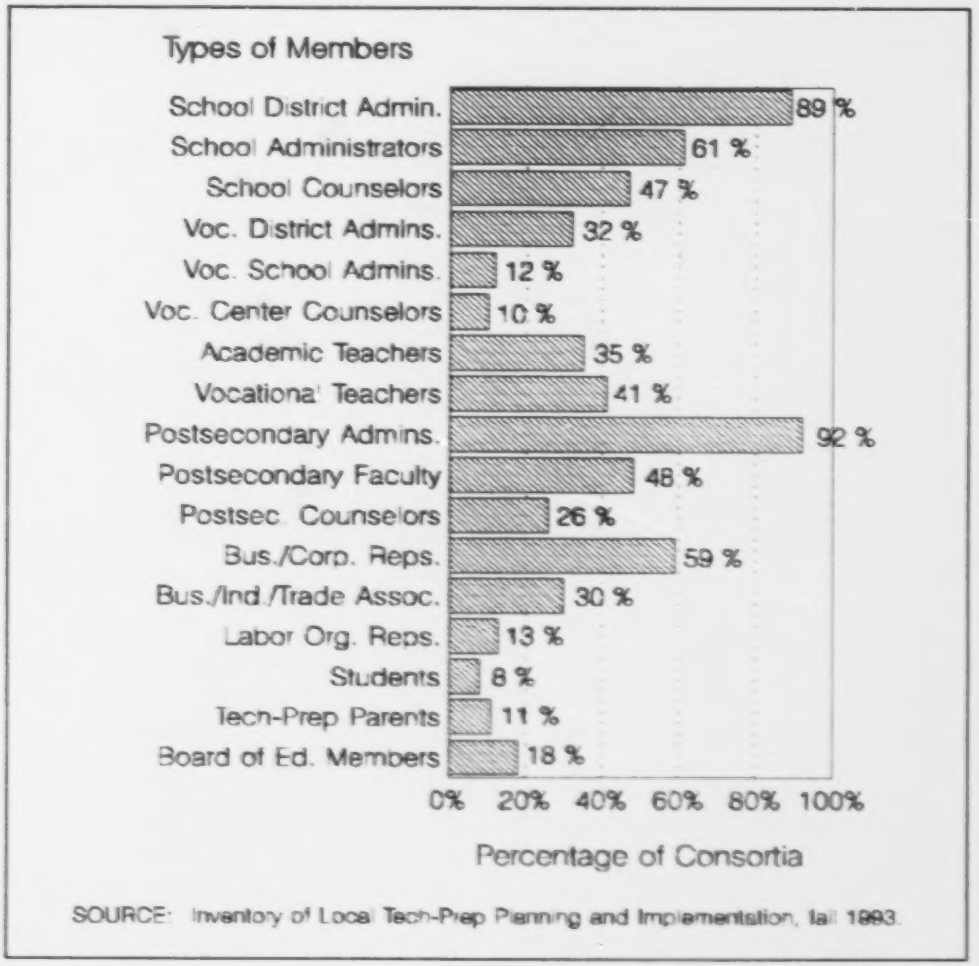
[4]Representation on a governing board indicates institutional membership and is not necessarily a measure of active participation and support. We examine the relative roles of secondary and postsecondary institutions in later chapters.

FIGURE IV.3

REPRESENTATION OF TECH-PREP GOVERNING BOARDS:
PERCENTAGE OF CONSORTIA WITH ANY BOARD MEMBERS FROM EACH GROUP



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Leadership of the boards is split roughly evenly between secondary and postsecondary representatives

Tech-Prep governing boards are about equally likely to be chaired by a representative from a secondary school district or individual school and from a postsecondary institution. About 40 percent of the consortia have designated a secondary representative as board chairperson, and 40 percent have designated a postsecondary representative as chairperson. Another 10 percent of the boards are chaired by a representative of a vocational district or center. Fewer than 3 percent of consortia are led by a business or corporate representative. Smaller consortia tend to have secondary staff as a chairperson, whereas larger consortia tend to have a chairperson from a postsecondary institution or business.

CONSORTIUM RESOURCES

Most consortia need resources--funding and staff--to facilitate communication and coordination among consortium members, encourage staff development, pursue articulation agreements and development of new curriculum, and promote the program to students, teachers, and parents. In fact, research suggests that a lack of resources can be a significant barrier to full implementation of Tech-Prep (Layton and Bragg 1991).

The national survey solicited several kinds of information about consortium resources. It included questions to determine whether the consortia had staff dedicated to consortium-wide activities and, if so, how many. It also asked for data on Title IIIE grant amounts, total funding for Tech-Prep, and types of expenditures for FY 1993.

Almost one-third of consortia reported operating without designated consortium staff

A total of 203 consortia (30 percent) reported having no professional staff dedicated either full- or part-time to consortium-wide Tech-Prep activities (Table IV.1). Not unexpectedly, smaller consortia (those with the fewest number of schools) were most likely to report having no consortium staff. These consortia may not believe it necessary to define certain positions as consortium staff, and may instead incorporate responsibilities relating to Tech-Prep in the functions of current district or postsecondary staff. In such situations, local respondents may not report that they have consortium staff. Smaller consortia also tend to receive smaller Title IIIE grant amounts and may be unable to support staff for general consortium coordination with these funds.

The number of central staff supported by a consortium is related to its size

Consortia with more members--secondary districts, schools, vocational centers, and postsecondary institutions--employ a larger number of professional staff to handle consortium-wide planning and implementation (Table IV.1). On average, consortia with fewer than five schools have 0.8 full-time equivalent (FTE) consortium staff, whereas those with more than 50 schools have 2.0 FTE consortium staff.[5]

Most consortia had received funds for Tech-Prep development for at least one year

Most consortia that responded to the fall 1993 survey were already past the initial start-up phase of consortium development. About 75 percent of the survey respondents were awarded a Title IIIE grant for FY 1992--the first year for which these Perkins grants were available--and had therefore been through a second year of funding at the time of the fall 1993 survey. Only one-fourth of the sample members received their first Title IIIE grant for FY 1993.

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[5]The reporting of more than four FTE staff by some consortia may be the result of misunderstanding our definition of consortium staff. Although the question stressed that staff counted in this item be involved in "consortium-wide" activities, discussions with state Tech-Prep staff indicate that some coordinators may have included teachers at a particular high school in the estimates. This confusion is particularly understandable in consortia with one district and high school, where teachers involved in Tech-Prep may actually work with the entire consortium Tech-Prep student population.

TABLE IV.1

CONSORTIUM STAFF, BY CONSORTIUM SIZE
(Number of Consortia)

Total FTE Professional Staff	Total Number of Secondary Schools and Postsecondary Institutions in Consortium[a]					
	2-5	6-10	11-25	26-49	> 50	Total
0	84	59	49	10	1	203
.01-.99	25	40	33	4	3	105
1.0-1.99	36	54	135	37	4	266
2.0-2.99	3	12	29	16	8	68
3.0-3.99	3	5	13	5	2	28
4.0-4.99	0	5	3	2	1	11
5.0-7.99	4	3	2	0	1	10
8.0 or More	3	2	2	0	0	7
Missing			1	0	0	1
Mean FTE	**0.8**	**1.1**	**1.2**	**1.3**	**1.9**	**1.1**

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

[a]Includes secondary schools and vocational centers involved in Tech-Prep, as well as community and technical colleges, four-year colleges and universities, proprietary schools, and registered apprenticeship programs.

Title IIIE is the main source of support for Tech-Prep

Consortia relied primarily on Title IIIE grants to fund consortium-wide activities in FY 1993, although some reported receiving funds from multiple sources. All consortia in the sample were Title IIIE grantees, by definition. Nineteen percent of the consortia also reported receiving funds from other titles of the Perkins Act to be used specifically for Tech-Prep reforms. About 13 percent reported receiving other state funds for Tech-Prep.[6]

Consortia spend most of their funds on administration, staff development, and equipment

About three-fourths of consortium expenditures are for general administration, staff development, and equipment for secondary or postsecondary programs (Table IV.2). The relatively substantial allocation to administration probably reflects, in part, the use of Tech-Prep grants by many consortia to fund staff to oversee consortium-wide activities--staff whose role is likely to be coordination among consortium members. Both staff development and equipment usually entail purchasing goods and services. For staff development, consortia often hire consultants to conduct training and expend funds on travel and conference registration fees. Equipment expenditures are likely to include the costs of outfitting new applied academics laboratories and upgrading career centers.

Other categories of expenditure may more likely be supported through in-kind contributions. Although curriculum development is generally reported as a major activity in the early years of Tech-Prep planning and implementation, outright consortium expenditures may be less necessary for this activity. Teachers may use common planning periods--regularly paid for out of district budgets--or their personal time to prepare or revise curricula. Similarly, marketing and promotion of Tech-Prep in many consortia may fall under the normal responsibilities of school counselors, and therefore not require extra funding.

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[6]These estimates may not fully reflect all sources of funding for Tech-Prep. Discussions with both consortium and state Tech-Prep coordinators suggest that some consortium coordinators are not completely aware of the sources of their funding; they are unable to distinguish between federal funds (Title IIIE and other Perkins) awarded by the state and funds allocated out of state appropriations.

TABLE IV.2

USES OF CONSORTIUM FUNDS, FY 1993
(Percentage of Total Expenditures)

	Mean	Minimum	Maximum
General Administration	24.2	0.0	100.0
Staff Development	23.0	0.0	100.0
Curriculum Development/Review	14.7	0.0	95.0
Equipment for Secondary/ Postsecondary Programs	23.6	0.0	100.0
Marketing/Promotion	5.7	0.0	55.0
Evaluation	2.0	0.0	20.0
Allocations to Consortium Members	5.6	0.0	95.0
Other	1.2	0.0	100.0

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

V. DEFINING TECH-PREP

Tech-Prep has come to describe a variety of approaches to education reform. Hull and Parnell (1992) originally conceived of Tech-Prep as a parallel pathway of preparation--equivalent to college-prep programs of study--for students interested in technical careers. They saw Tech-Prep as a promising alternative to the less academically demanding general education track, a way to offer students a "seamless" sequence of challenging courses spanning grades 11 through 14, integration of academic and vocational education, and defined programs of study organized around broad technology-oriented career themes. Tech-Prep would encourage higher career aspirations and better workforce preparation among students in the middle 50 percent of the academic ability distribution.

The definition of Tech-Prep in the Perkins Act reflects the ideas of the Hull and Parnell model. Title IIIE of the act broadly outlines a plan for the content and expected outcomes of Tech-Prep programs. The programs must be carried out under articulation agreements among consortium members and must consist of the last two years of high school and two years of postsecondary education. They must provide a "common core of required proficiency in mathematics, science, communications, and technologies" through a "sequential course of study," to facilitate technical preparation in engineering technology; applied science; mechanical, industrial, or practical art or trade; agriculture; health; or business. Tech-Prep programs should be designed to lead to an associate degree or two-year certificate and to employment. The legislation acknowledges that it may be necessary to develop new curricula in order to achieve these objectives.

However, the Perkins Act leaves room for varied interpretation and implementation approaches. Findings from both the in-depth studies and the fall 1993 national survey of Title IIIE grantees demonstrate that consortia implement Tech-Prep in diverse ways. For example, some Tech-Prep programs encompass activities or courses that begin in the earlier years of high school or even middle school, and some may be offered in occupational areas that are not considered technology-oriented. In other cases, divergences from the model implied by the legislation may reflect programs' early stage of development and may change over time. For example, "programs of study" may at first consist solely of existing vocational courses, without related academic classes. Articulation efforts between secondary and postsecondary institutions may focus on courses, rather than programs.

This chapter examines three ways of characterizing a Tech-Prep program. First, we describe the basic program model that consortia are seeking to implement--that is, the grade levels at which Tech-Prep activities begin and end. Second, we discuss the extent to which consortia are implementing a defined core program, or a set of activities in which all secondary-level Tech-Prep students are expected to participate. Third, we describe how consortia define who is to be considered a Tech-Prep student.

DEFINITION OF A PROGRAM MODEL

Although the Perkins legislation requires Tech-Prep programs to include the last two years of high school and two years of postsecondary education or training, consortia are implementing many

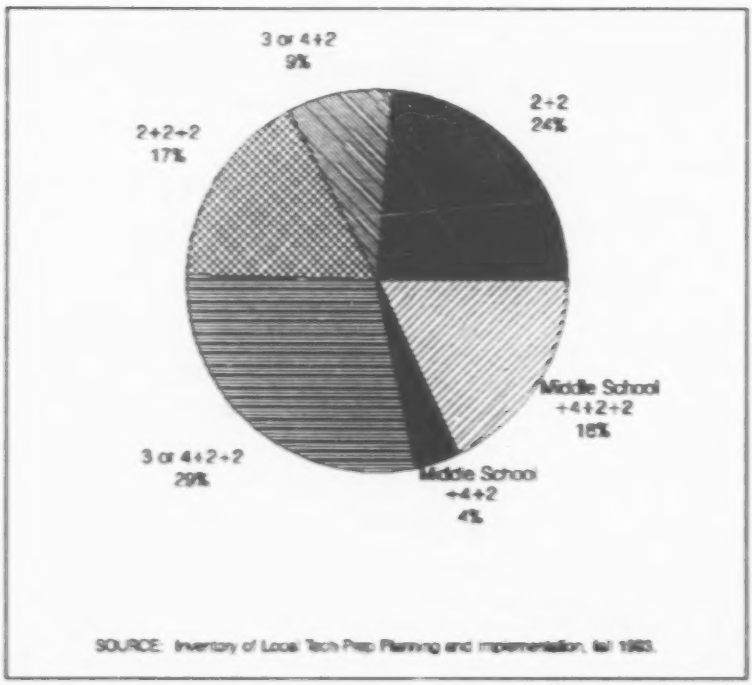
variations to the "2 + 2" model (Silverberg 1993).[1] Some Tech-Prep programs begin in the 9th or 10th grade, or even in middle school, and others extend beyond community college, to culminate in a baccalaureate degree. To determine the range of models that consortia are developing for Tech-Prep, we asked consortium coordinators to describe their basic program model. Possible response categories encompassed all combinations of middle, secondary, and postsecondary options, including (1) the last two years of high school; (2) three or more years of high school; (3) one or more years of junior high/middle school; (4) two years at a community college; and (5) options for additional study at a four-year postsecondary institution. Because we anticipated that most consortium programs would not have been fully developed at the time of the survey, our objective was to document both planned and implemented models.

Most consortia report models for Tech-Prep that begin earlier and extend later than required under federal law

Consortia report ambitious models for Tech-Prep that affect more grade levels than the "2 + 2" program originally defined in the Perkins legislation (Figure V.1). In fall 1993, 60 percent of the

FIGURE V.1

PROGRAM MODELS IN PROGRESS
(Percentage of Consortia)



SOURCE: Inventory of Local Tech Prep Planning and Implementation, fall 1993.

[1]Amendments to the Tech-Prep Act have broadened the models that can be supported by Title IIIE funds to include "4 + 2." Some consortia are using funds from other sources to support related activities even for middle school students.

consortia reported including 10th grade or 9th and 10th grade in the Tech-Prep program. Of those including the early years of high school, 37 percent (22 percent of all consortia) claimed to offer program components in middle school. Almost two-thirds of all consortia reported incorporating options for transfers from community colleges to four-year colleges into the Tech-Prep program model.

Actual Tech-Prep implementation is likely to differ from the program models reported

Because the survey asked coordinators to report the Tech-Prep model they were "working to implement," the responses probably do not reflect current implementation of Tech-Prep. For example, 64 percent of the consortium coordinators reported that their models included options for additional study at a four-year postsecondary institution, but only half of those reported having a four-year college or university as a consortium member.

How a component or activity is defined as "Tech-Prep" affects the extent to which reported program models become a reality. The in-depth studies and discussions with both local and state Tech-Prep coordinators suggest that it is not always evident that Tech-Prep begins or ends in a particular grade. For example, some consortia may consider a new approach to providing classroom career exposure activities for all 8th-graders as a middle school Tech-Prep component, but others view these activities as simply an improvement to the overall career guidance system. What does it mean to include additional study at a four-year college as part of a Tech-Prep program? Most community colleges have arrangements enabling students who complete an associate degree--not simply those in Tech-Prep--to transfer some credits to particular four-year institutions. Of course, some arrangements may be specific to Tech-Prep; for example, some consortia may develop articulation agreements between community and four-year colleges for select occupational programs that encompass the full range of Tech-Prep articulated course work, from high school to college, and that will constitute a routine pathway for students in those career areas.

DEFINITION OF A CORE PROGRAM

Programs are generally defined by the activities in which participants are involved. Although cohesive Tech-Prep programs may allow students to make choices (for example, of career clusters), they normally have some requirements that ensure a common core experience for those involved. This common experience provides the basis for measuring participation; without it no two Tech-Prep students can be said to have been part of the same program. The structure or required set of activities that define a Tech-Prep program--what we call the "core program"--may become available only after all components are fully implemented, and it may change over time. Tech-Prep consortia may differ in the extent to which they promote a common experience for participating students and in critical program components, in part because some are still in the planning stages.

We asked consortium coordinators whether a core program for all secondary-level Tech-Prep students had been implemented, defining "core program" as the set of activities in which *all* Tech-Prep students were expected to participate. Coordinators indicated which elements were core program components by selecting from a list that included (1) completing an individual student plan indicating a sequence of secondary and postsecondary courses, (2) choosing a broad career cluster, (3) choosing an occupational specialty within a career cluster, (4) taking applied academic courses, (5) taking required or elective academic or vocational courses related to a career cluster,

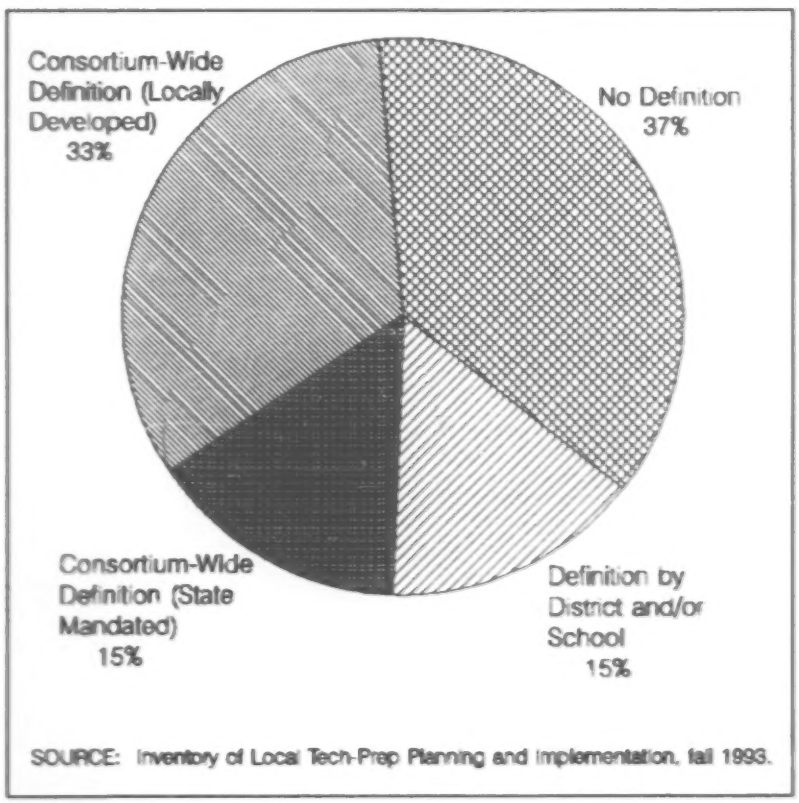
(6) participating in specified types of career development activities or classes, and (7) participating in specified workplace activities.

In most consortia, a defined core program has been adopted by all or some members

Most consortia report having a required set of activities or courses that define the Tech-Prep program. A majority (63 percent) of consortia reportedly have implemented a specified set of activities for all Tech-Prep students in at least some schools or districts in the consortium (Figure V.2). Almost half of the consortia have a defined core program that has been adopted uniformly by all members of the consortium. In two thirds of these cases (33 percent of consortia overall) the consortium-wide definition was developed locally by the members and/or by consortium staff; in the remaining one-third, the definition of a core program was reportedly mandated by state agencies. Another 15 percent of the consortia have defined core programs that vary across individual member districts and/or schools.

FIGURE V.2

SOURCES OF CORE PROGRAM DEFINITIONS
(Percentage of Consortia)


Consortium-Wide Definition (Locally Developed) 33%
No Definition 37%
Consortium-Wide Definition (State Mandated) 15%
Definition by District and/or School 15%

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

consortium-wide. These findings suggest that it may take consortia a few years to decide "what the Tech-Prep program is." Before defining and implementing the key elements of Tech-Prep student experiences, consortia may need time to define objectives, develop articulation agreements and new curricula, conduct staff training, and build consensus across consortium institutions, to develop a program definition that is acceptable to all members.

Having a state definition of Tech-Prep does not guarantee consistent local understanding of it

Some states have tried to encourage consistency in approaches to Tech-Prep. However, in most states, consortia are developing their own program definitions, even if their state agency provides guidance or imposes requirements. Twenty-seven state Tech-Prep coordinators reported developing a required definition for Tech-Prep program goals and components and most other state coordinators reported prescribing at least some features of Tech-Prep with which consortia were expected to comply. However, only a small proportion of consortia in most of these states reported relying on a state definition for a core program. Outside of those with only a single statewide consortium, only in three states did substantial proportions of consortia confirm the existence of a state mandated program definition; more than 75 percent of consortia in Arkansas, Idaho, and Indiana reported adopting a state definition for a Tech-Prep core program. In South Carolina and Texas, about half of the consortia with any type of core program reported adopting what they believed to be a state definition.

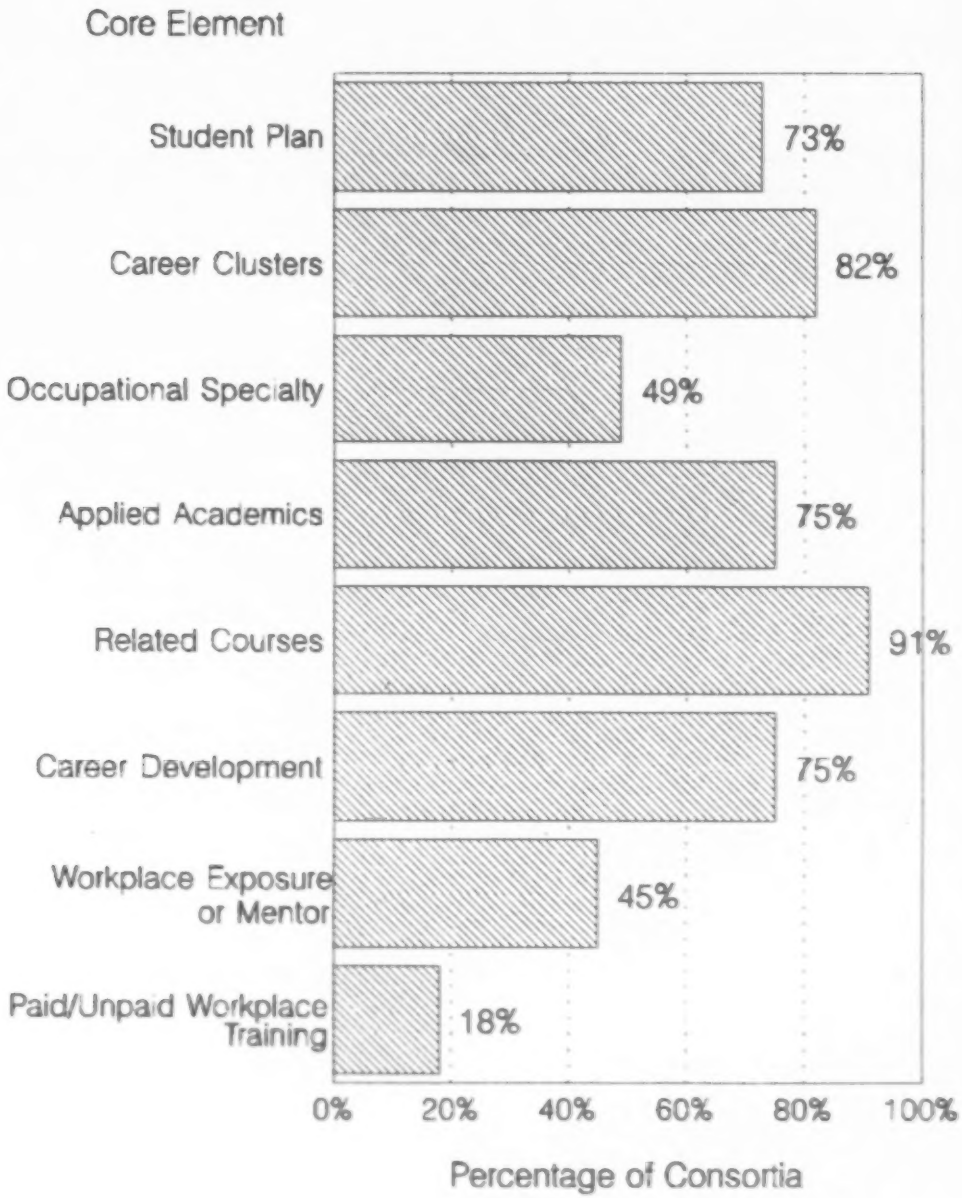
Some key elements of core programs are common to most consortium-wide definitions

Consortium coordinators' reports indicate that many Tech-Prep consortia have similar components. Five of the key features identified in the Tech-Prep literature are reportedly components of most consortia's core programs (Figure V.3). At least three-fourths of consortia that have consortium-wide definitions of a core program expect Tech-Prep students to (1) choose a broad career cluster; (2) take or complete one or more applied academic courses; (3) take required academic or occupational courses related to a career cluster, or take a minimum number of such courses as electives; and/or (4) participate in career awareness/development activities.[1]

[1]Data on core program elements were collected only from the 336 consortia with consortium-wide definitions. Although another 100 consortia have defined core programs in at least some of their schools, these definitions vary across schools and districts, and it would have been overly burdensome to ask consortium coordinators to define each school's core program separately.

FIGURE V.3

ELEMENTS OF DEFINED CORE PROGRAMS



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

NOTE: The statistics are for consortia that have a uniform definition of a core program adopted by all consortium members.

Although these consortia combine definition elements in different ways, some core program models were reported relatively frequently (Table V.1). The most common model--reported by almost 20 percent of consortia--is, in many ways, the most complicated to implement. This model requires all Tech-Prep students to choose a career cluster and occupational specialty, enroll in applied academic courses, take academic and vocational courses related to their career cluster, participate in career development classes or sessions, and participate in occasional workplace exposure experiences or mentor activities.

Although the survey question asked coordinators to indicate "which elements are *currently* part of the core program for Tech-Prep," we believe that responses partially reflect program goals, rather than actual program operation. Roughly 20 percent of the consortia that reported requiring students to choose a broad career cluster as part of the Tech-Prep program model do *not*, according to another survey question, currently have any member schools in which broad career clusters are "defined and used to guide Tech-Prep students' choices of academic and vocational courses." This finding suggests that the concept of these elements as real requirements for all Tech-Prep students may be "in progress," rather than fully implemented. Similarly, some combinations of core program elements call into question the model being defined. For example, it is hard to determine what a consortium means by a "broad career cluster" when it requires students to choose a cluster but does not require them to take cluster-related academic or occupational courses. Thirty-eight consortia (almost 10 percent of those with consortium-wide core programs) reported this as part of their definition.

To date, required workplace experiences are mostly low-intensity activities

Workplace activities are reportedly a standard part of Tech-Prep student experiences in about half of the 336 consortia with consortium-wide definitions. However, the consortia were much more likely to classify occasional workplace exposure activities as a key element of the program, rather than ongoing instruction at a work site (Figure V.3). Forty-five percent reported that their programs involve all Tech-Prep students in relatively low-intensity workplace activities, such as job shadowing, work site tours, or interactions with an assigned mentor. In contrast, only 18 percent require Tech-Prep students to participate in a regular schedule of instruction or training at a work site, or to work as a paid youth apprentice in a position related to a course or career focus chosen in Tech-Prep.

Rural consortia are much less likely than suburban consortia to include workplace experiences of any kind in the Tech-Prep core program (Figure V.4). This difference probably reflects the comparatively more limited access to employers and narrower range of industries in rural areas. Federal officials have acknowledged the difficulties of implementing work site activities in rural communities by establishing a program of grants to low-income rural (and urban) areas under the School-to-Work Opportunities Act.

TABLE V.1

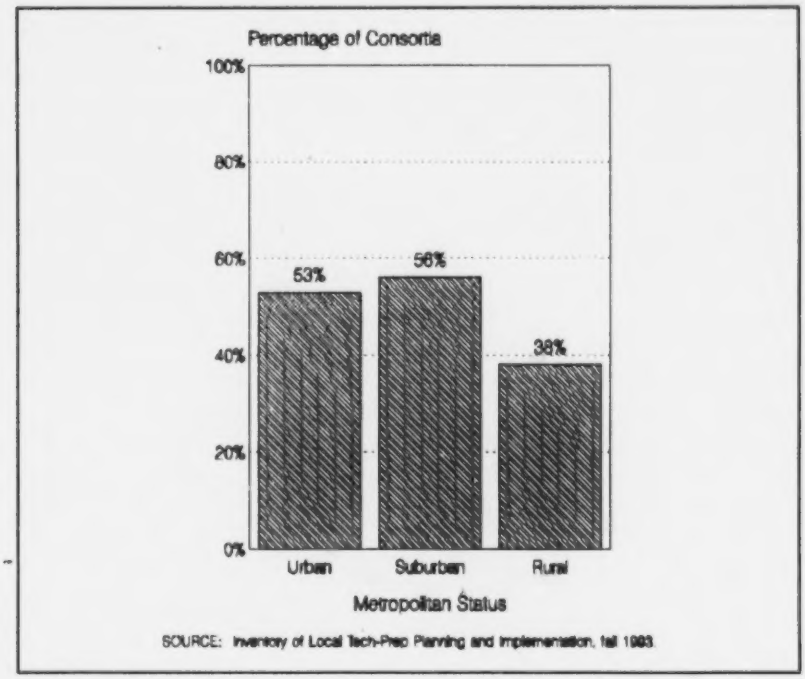
MOST COMMON CORE PROGRAMS AMONG TECH-PREP CONSORTIA THAT HAVE CONSORTIUM-WIDE DEFINITIONS

Elements of Consortium-Wide Core Programs								
Completing Student Plan	Choosing Career Cluster	Choosing Occupational Specialty	Taking Applied Academic Class(es)	Taking Cluster-Related Academic/Occupational Courses	Participating in Career Development Sessions/Classes	Participating in Workplace Exposure Experiences/ Assignment to Mentor	Number of Consortia	Percentage[a] of Consortia
			X	X	X		7	2.1
			X	X		X	6	1.8
X		X	X	X			34	10.1
X				X	X	X	7	2.1
	X	X	X	X			15	4.5
	X	X		X	X		10	3.0
	X	X			X	X	9	2.7
	X			X			25	7.4
	X				X		15	4.5
			X	X	X	X	17	5.1
X		X	X	X	X		21	6.3
X			X	X	X	X	39	11.6
	X	X	X	X	X	X	66	19.6
All Definitions							271	80.8

[a]The percentage of consortia was calculated using as the denominator the number of consortia reporting a consortium-wide definition of a core program (336 of 702).

FIGURE V.4

PERCENTAGE OF CONSORTIA INCLUDING WORKPLACE ACTIVITIES OF ANY KIND IN CORE PROGRAM, BY METROPOLITAN STATUS



Although relatively few consortia required workplace experiences as part of Tech-Prep in fall 1993, the number is likely to increase. Discussions with state and local Tech-Prep coordinators suggest that consortia are increasingly interested in offering workplace activities to Tech-Prep students. Much of this interest is related to the passage of the School-to-Work Opportunities Act and the funding that consequently will be available to develop workplace experiences.

DEFINITION OF A TECH-PREP STUDENT

Defining the program model and core program elements helps to characterize students' Tech-Prep experience, and to shape what it means to be a Tech-Prep student. For example, if the core program includes applied academics and career-cluster-related courses--and truly reflects the set of activities in which all Tech-Prep students are expected to be engaged--then students identified as "in Tech-Prep" typically will have taken those courses.

How consortia define Tech-Prep participation potentially affects program image, student morale, and performance reporting. Generally, consortia take one of two very different approaches to defining participation. On the one hand, some consortia believe Tech-Prep should not be considered a distinct program because it will lead inevitably to the stigma associated with "tracking," particularly of vocational students. Consortia following this approach may not differentiate students in Tech-Prep from the general student population or may count students as in Tech-Prep if they happen to take

any of the courses considered fundamental to the Tech-Prep initiative (for example, articulated vocational courses). Students, however, are unaware of their participation in a "program." On the other hand, some consortia view Tech-Prep as a true program; students apply for admission, enroll, and participate in a defined set of activities that set them apart from other students. These consortia often consider a cohesive Tech-Prep program to have the added benefit of allowing students to feel that they are part of something special, and may encourage students to wear Tech-Prep logos or take them on special field trips to reinforce this attitude. Regardless of the approach used to identify Tech-Prep students, developing a concrete definition of participation allows consortia to count Tech-Prep students and to track their outcomes--capabilities that are important for reporting to state and federal agencies interested in the progress of Tech-Prep reforms.

The challenges consortia face in defining Tech-Prep participation depend on how the program is organized. When Tech-Prep is not viewed as a distinctive program, consortia often make components broadly available and students take advantage of or participate in these components--courses or activities--at different points and different levels of intensity. Under these circumstances consortia are likely to find it more difficult to identify which students are in Tech-Prep at a given time. If Tech-Prep is organized as a cohesive program with a defined set of required courses, it is easier to identify participants. Some consortia may begin implementing Tech-Prep as an unconnected set of courses, but over time begin to define programs of study and determine the individual components that should be part of the core program experience.

Data from the national survey reveal the variation in Tech-Prep program organization, as reflected in the definitions of participation. The myriad of ways in which consortia defined a Tech-Prep student--even constrained by the response categories in the questionnaire--suggest real differences in implementation approach and priorities, and probably stages of development. Discussions with local coordinators in the in-depth study and other sites suggest that many consortia had not previously had to determine how they would identify and count Tech-Prep participants, either because they had not yet enrolled students or because state agencies had not required them to report. In many cases, the national survey acted as a catalyst for constructing a definition of Tech-Prep participation.

To document how consortia define Tech-Prep participation, we asked coordinators to report the minimum criteria necessary for a student to be counted as "in Tech-Prep." We asked only for the minimum in order to differentiate the core program (the full set of activities in which students would eventually be engaged) from the manner in which students are identified and counted as "entering" Tech-Prep. Coordinators were asked to document the combination of criteria they use to identify the students in Tech-Prep. A list of criteria for defining participation was specified that overlapped with some elements of core programs: (1) student explicitly elects Tech-Prep as a path, major, track, or program; (2) student completes an individual student plan; (3) student takes or completes one or more vocational courses; and (4) student takes or completes one or more applied academic courses.

Most consortia report a definition of Tech-Prep participation

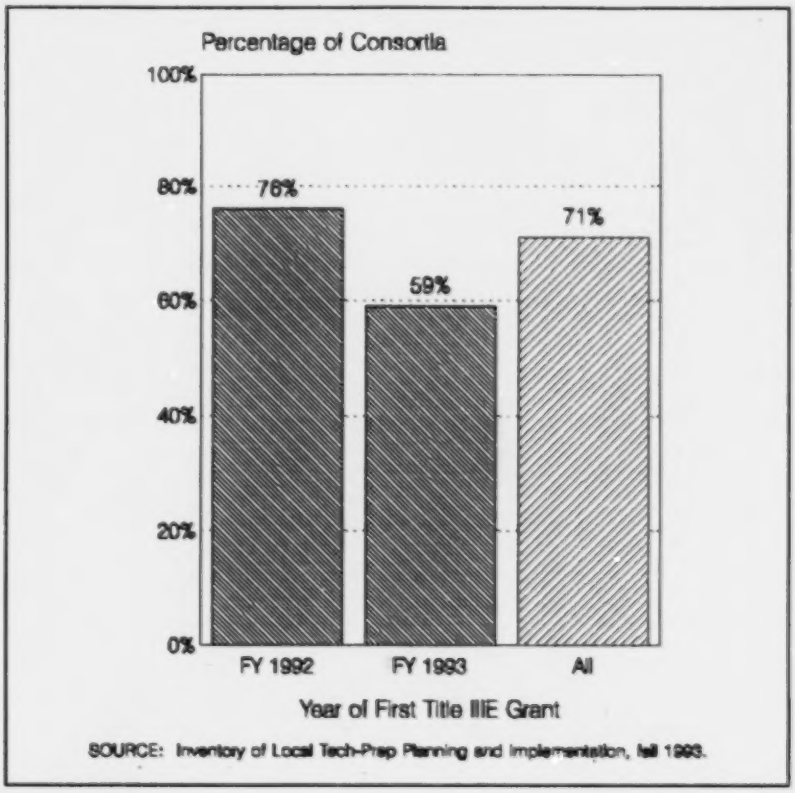
Most consortia were able to state the basis on which they would identify Tech-Prep students. In fall 1993, more than 70 percent of the consortia reported having a definition of which secondary students are to be counted as "in Tech-Prep." In about 10 percent of these consortia, each participating school or district determined its own definition. Even consortia that did not report a definition for a core program (that is, lacked a specified set of activities required for all Tech-Prep students) reported having a definition for how to identify and count students. Slightly

fewer than half (117) of the 256 consortia that did not have a core program nevertheless reported that they had a definition of participation.

More established consortia are more likely to have a definition for identifying Tech-Prep students. Three-fourths of the consortia that received their first Title IIIE grant in FY 1992 reported having a definition for participation, compared with 59 percent of those that received their first grant in FY 1993 (Figure V.5).

FIGURE V.5

PERCENTAGE OF CONSORTIA REPORTING A DEFINITION OF TECH-PREP PARTICIPATION, BY YEAR OF FIRST TITLE IIIE GRANT



Applied academic classes and vocational classes are common elements of the definition of a Tech-Prep student

Definitions for identifying and counting Tech-Prep students vary widely. Consortia reported 18 combinations of the four criteria for counting participation--students' choice of Tech-Prep as a path, completion of a four- or six-year student plan, vocational course taking, and taking applied academics (Table V.2).

TABLE V.2

CRITERIA FOR DEFINING TECH-PREP PARTICIPATION

Definition Criteria				
Chooses Tech-Prep	Student Plan	Vocational Courses	Applied Academics	Number of Consortia
X				33
	X			18
		X		16
			X	14
				2
				7
				4
X	X			40
X		X		10
X			X	9
	X	X		14
	X		X	13
		X	X	23
X	X	X		46
X	X		X	20
X		X	X	25
	X	X	X	39
X	X	X	X	106
All Consortia with Definition Criteria				439

Linking applied academic and vocational courses has been identified in the literature as a key element of Tech-Prep programs (Silverberg 1993). Many consortia reported including participation in both applied academic and vocational course work in their definitions of participation. Almost 200 (44 percent) of the consortia that reported a definition for counting Tech-Prep students included both elements. About half of these (106) reported a definition that also includes explicitly choosing Tech-Prep as a path, and completing a student plan--the definition that comes closest to the program model promoted by Hull and Parnell. This definition also best represents the concept of participating in a defined program of study--one of the objectives of Title IIIE of the Perkins legislation.

Some consortia defined participation more narrowly than their core program. For example, 46 of the 208 consortia that reported that applied academic courses were part of their core Tech-Prep program did not include participation in these classes in their minimum definition of a Tech-Prep student. Similarly, 76 of the 253 consortia that included vocational course taking in the definition of the core program did not include it in the definition of participation. It is also possible, of course, that despite instructions in the questionnaire, consortia described elements of their core programs that have not been fully implemented. In reporting their criteria for counting Tech-Prep students, consortia may be more likely to rely on components that were already implemented.

Many consortia receive state guidance on definitions of Tech-Prep participation

State agencies often guide local consortia in how to define Tech-Prep participation. Twenty-seven state coordinators reported that they had developed a definition, and 18 of them said local consortia are required to use that definition in reporting on student participation.

Communication between state and local coordinators about the state's guidance is often unclear, however. At least some local coordinators in 41 states reported using a definition of participation established by their state, which suggests that at least some interpreted general state guidance as a directive. On the other hand, where states are trying to establish a consistent statewide definition of participation, it is inconsistently understood. In only 12 of the 18 states that had developed a participation definition and mandated its use did more than 75 percent of the consortia report they used it.

VI. PARTICIPATION IN TECH-PREP PROGRAMS

Data on the number of students participating in Tech-Prep are important as a measure of implementation progress and potential program effects. However, there is some ambiguity about what it means to participate in Tech-Prep. Consortia have different definitions for which students are counted as "in Tech-Prep;" some have no clear definition (see Chapter V). Some consortia that have developed a definition for participation cannot report numbers of Tech-Prep students, either because they have not yet enrolled students or because they are unable to document enrollment in member schools. Other consortia report enrollments but not the basis on which they identify students as "in Tech-Prep."

In this chapter, we examine the capacity of local consortia to report Tech-Prep participation and the number of Tech-Prep students they reported for FY 1993. We first describe factors that could affect consortia's ability to identify which students are "in Tech-Prep" and the proportions of consortia and districts that can report student counts. We then present reported participation rates by grade and as a percentage of the overall student population. We also discuss the demographic characteristics of Tech-Prep students and steps that consortia have taken to promote access to Tech-Prep for special populations.

CAPACITY TO REPORT STUDENT PARTICIPATION

Many consortia were unable in fall 1993 to report on student participation in Tech-Prep for the previous school year. Three important factors can affect an individual consortium's capacity to measure participation.

First, relatively new consortia may still be planning and determining objectives, target population, and program elements. Some practitioners and researchers have suggested that consortia must devote at least one year to planning before enrollment can begin (Walter 1991). Other research indicates that consortia may spend an average of three to five years on planning and full implementation (Dutton 1991). More than one-fourth of the survey respondents had received their first Title IIIE grant for FY 1993--the year for which student counts were requested--and the remainder had received their first grant one year before. Thus, in fall 1993, we might expect that some consortia would not yet be prepared to identify Tech-Prep students. About one-third of consortia lacked a *definition for identifying Tech-Prep students* at the time of the national survey. Even among those that could report they had defined participation by the fall 1993 survey, some may have only begun counting participants that fall and thus could not respond to survey questions about participation in school year 1992-1993.

Second, some consortia may not have the *capacity to collect data* on student participation. Even consortia that have developed a definition for identifying which students are in Tech-Prep, and that have students participating in the program as it is defined by them, may be unable to assemble the information. Member districts may lack computerized files that enable them to determine the number of students meeting the Tech-Prep definition--for example, students who take a vocational course and related applied academic courses. Some consortia may not operate as a cohesive unit. Consortium staff may lack the leverage to request or require student-level data collection efforts of individual member districts. Lack of cooperation among districts and schools may prevent student counts from being collected and reported.

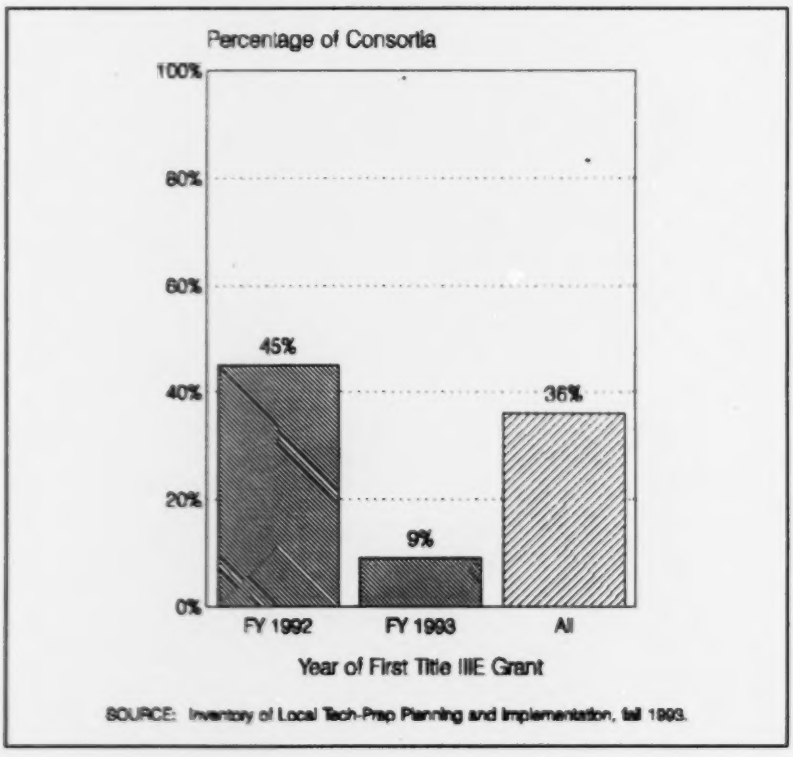
Third, the *organization of a Tech-Prep program* can affect the capacity to measure participation. Consortia that implement Tech-Prep as a distinct program may find it easier to document participation. When participants are defined by their "choice" of Tech-Prep as a path, school or consortia staff can count application forms, for example, to determine the number of participating students. Consortia that make Tech-Prep components broadly available to all students, and in which students participate to different degrees, may have greater difficulty identifying who is a Tech-Prep student.

Development stage affects the ability to report student participation

Consortium capacity to report participation in Tech-Prep for school year (SY) 1993 is fairly limited. Overall, 250 (36 percent) of the 702 consortium respondents had begun to identify and count participating students that year (Figure VI.1). This proportion is lower than the estimate by the National Assessment of Vocational Education (NAVE) of the proportion of regular school districts that reportedly have established formal Tech-Prep enrollment procedures (48 percent) (NAVE 1994, p. 350). In part, this difference may reflect the fact that districts that have established procedures for enrolling or identifying Tech-Prep students may not yet have actually enrolled students. Our lower estimate includes only consortia that reported actual numbers of participating students.

FIGURE VI.1

PERCENTAGE OF CONSORTIA ABLE TO REPORT ON 1992-93 TECH-PREP PARTICIPATION, BY YEAR OF FIRST GRANT



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

The "maturity" of a consortium seems to influence its ability to measure participation, just as it affects the likelihood of having developed a definition on which the counts are based (see Chapter V). Data from the fall 1993 survey confirm that older consortia are more likely to be able to identify Tech-Prep students. Forty five percent of the early grantees--those that received their first Title IIIE grant in FY 1992--were able to report Tech-Prep enrollments, whereas only 9 percent of the FY 1993 grantees were able to do so (Figure VI.1).

Capacity to report enrollments varies significantly across states

Consortia in some states have been more successful in developing student reporting capacity than have those in others (Table VI.1). More than 75 percent of consortia in five states can identify Tech-Prep students; in three of these five, there is a single, statewide consortium. In contrast, none of the consortia in ten other states could report the number of students participating during SY 1992-1993. In most states, 25 to 75 percent of consortia were able to measure participation.

Although individual consortium differences probably explain some of the variation in reporting capacity, state policies influence reporting capacity as well. State agencies, in Ohio, for example, provide guidance to local consortia on developing curricula and defining core programs and participation criteria. Because Ohio has encouraged consortia to implement programs carefully and fully before enrolling and "counting" students, none of the 13 consortia in the state were yet prepared to report participation numbers for the fall 1993 survey. In California, where few Title IIIE grants were awarded in time for FY 1992, most consortia were still in the planning stages; only one consortium had formulated and applied a definition of participation by the time of the national survey. Consortia and state agencies in Oregon have developed a simple statewide definition for counting Tech-Prep students[1] and have made individual schools and regional vocational committees responsible for collecting these enrollment figures. This strategy probably explains why more than half of the consortia in Oregon were able to report the number of participating students.

The survey findings indicate that in almost all consortia containing multiple school districts--the majority of consortia--only some member districts are able to determine Tech-Prep enrollments (Table VI.1). Although 36 percent of consortia nationwide could report student participation, they could do so for only 17 percent of their consortium districts. This pattern suggests that Tech-Prep is unevenly implemented across member districts in many consortia. Some consortia may be in a pilot phase, concentrating implementation efforts in a few schools or districts. In others, districts are at different implementation stages, with only the more advanced districts able to document Tech-Prep participants. Consortia with many member districts (intuitively, the most likely to have uneven implementation) have the smallest proportion of districts that can report enrollments.

[1]Tech-Prep participation in Oregon is equivalent to enrollment in an articulated vocational course.

TABLE VI.1

PERCENTAGE OF TECH-PREP CONSORTIA AND THEIR DISTRICTS THAT CAN REPORT STUDENT PARTICIPATION FOR SY 1992-1993, BY STATE

	Number[a]		Percentage that Can Report	
State	Consortia	Districts	Consortia	Districts
Alabama	27	102	52	31
Alaska	2	2	0	0
Arizona	15	67	40	30
Arkansas	13	58	62	29
California	44	210	2	1
Colorado	13	59	23	5
Connecticut	9	58	56	40
Delaware	1	14	0	0
District of Columbia	1	1	100	100
Florida	16	36	56	39
Georgia	46	94	30	23
Hawaii	4	4	0	0
Idaho	6	93	0	0
Illinois	28	323	32	13
Indiana	13	275	62	14
Iowa	5	36	60	17
Kansas	6	58	33	10
Kentucky	38	51	34	26
Louisiana	12	28	42	36
Maine	6	143	17	8
Maryland	15	23	53	44
Massachusetts	9	57	67	51
Michigan	37	489	19	11
Minnesota	18	209	17	3
Mississippi	14	72	7	4
Missouri	12	257	0	0
Montana	3	20	33	5
Nebraska	6	37	83	30
Nevada	3	9	100	33
New Hampshire	2	14	0	0
New Jersey	15	162	53	30
New Mexico	10	38	60	45
New York	26	166	46	34
North Carolina	42	65	55	54
North Dakota	1	53	0	0
Ohio	13	145	0	0
Oklahoma	10	59	40	9
Oregon	7	77	57	61
Pennsylvania	18	239	28	9

TABLE VI.1 *(continued)*

State	Number[a]		Percentage that Can Report	
	Consortia	Districts	Consortia	Districts
Rhode Island	1	20	100	100
South Carolina	16	93	63	73
South Dakota	4	58	0	0
Tennessee	14	114	71	54
Texas	25	692	52	14
Utah	8	40	38	20
Vermont	4	11	25	9
Virginia	21	124	10	2
Washington	15	105	7	4
West Virginia	11	32	36	16
Wisconsin	12	291	42	12
Wyoming	3	3	33	33
Puerto Rico	1	1	100	100
Virgin Islands	1	2	0	0
Total	**702**	**5,489**	**36**	**17**

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

[a]Numbers based on survey respondents.

How consortia define participation does not appear to affect their ability to report on it

Formulation of a definition for who is "in Tech-Prep" is often divorced from consortia's ability to report the number of students who meet the defined criteria. In fall 1993, more than 70 percent of consortia said they had developed a definition for Tech-Prep participation, but fewer than 36 percent could report the number of participating students in the previous school year. The type of definition developed by the 439 consortia with consortium-wide definitions did not influence their ability to report enrollments significantly (Table VI.2). Contrary to expectations, consortia in which students explicitly choose Tech-Prep were actually slightly below average in their ability to report prior-year enrollments.

REPORTED PARTICIPATION IN TECH-PREP PROGRAMS

The reported overall number of Tech-Prep students is a composite of participation in programs with very different models and program components. In some consortia, programs "begin" in the 11th grade; some begin in lower grades. Some consortia count students on the basis of participation in a single course, while others count students as participants only if they take a series of courses. The reader should bear in mind that all participation statistics reported here are *based on each consortium's own definition.*

To document participation, we asked coordinators to record the total number of students counted as "in Tech-Prep" in SY 1993 across member districts, by grade level. We also asked coordinators to estimate the racial/ethnic composition of the participating student population, and the percentage in several special population categories.

More than 172,000 students participated in Tech-Prep programs in 1992-1993

A total of 172,882 students participated in Tech-Prep programs during the 1992-1993 school year. This total was reported by the 250 consortia that were able to identify and count Tech-Prep participants during that year. An average of 692 students participated in each consortium; the reported number of participants ranged from 2 to 16,163.[2]

These students participated in programs with quite different designs and implementation approaches (Table VI.2). Of the 439 consortia that reported a consortium-wide participation definition, 192 (44%) were able to report counts of Tech-Prep students; more than 15 definitions were used by these 192 consortia.[3] One-quarter of the 192 defined participation in a way that

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[2]Only 43 of the 250 consortia reporting on participation reported more than 1,000 Tech-Prep students. The high count of 16,163 Tech-Prep students was reported by a very large consortium (23 districts) in which participation is defined by enrollment in an articulated vocational course. The next largest count of Tech-Prep students reported by a consortium was 8,497. The remaining 41 of the 43 consortia reported fewer than 5,000 participants, with most reporting between one and two thousand Tech-Prep students.

[3]These 192 consortia accounted for 88 percent of the total number of students reported by the 250 consortia that were able to identify and count Tech-Prep students. In the other 54 consortia that reported student counts, either individual members had different definitions (30 consortia) or the consortia lacked definitions for reporting participants (28 consortia).

TABLE VI.2

REPORTING CAPACITY AND COUNTS OF TECH-PREP STUDENTS IN SY 1992-1993, BY PARTICIPATION DEFINITION

Definition Criteria							
Chooses Tech-Prep[a]	Student Plan	Vocational Courses	Applied Academics	Other[b]	Number of Consortia Reporting a Participation Definition	Percentage that Can Report Participation	Number of Students Reported
X					33	42	9,650
	X				18	17	16,760
		X			16	56	11,723
			X		14	79	2,895
X	X				40	23	4,388
X		X			10	40	1,924
X			X		9	44	1,745
	X	X			14	57	10,585
	X		X		13	46	7,203
		X	X		23	48	10,957
X	X	X			46	46	16,690
X	X		X		20	55	3,127
X		X	X		25	40	1,539
	X	X	X		39	41	7,601
X	X	X	X		106	46	35,655
				X	13	46	10,145
Consortia with Definition Criteria					**439**	**44**	**152,587**
Consortia with Definitions Established by Individual Districts/Schools					54	56	11,064
Consortia with No Definition					209	13	9,231
All Consortia					702	36	172,882

NOTE: Definitions of participation were reported only by consortia in which all consortium members adopted the definition. These consortia are 76 percent of all consortia that reported participation numbers and accounted for 88 percent of all reported Tech-Prep students in FY 1993.

[a]In consortia where participation is defined based only on a student's choice of Tech-Prep, other program components are undoubtedly in place as well, but the consortia simplify the counting of Tech-Prep students by using a single criterion.

[b]These include consortia that define Tech-Prep students as all students in the consortium schools, all students in the consortium schools who have not chosen a college preparatory pathway, or all students who "meet the criteria defined in the Perkins legislation."

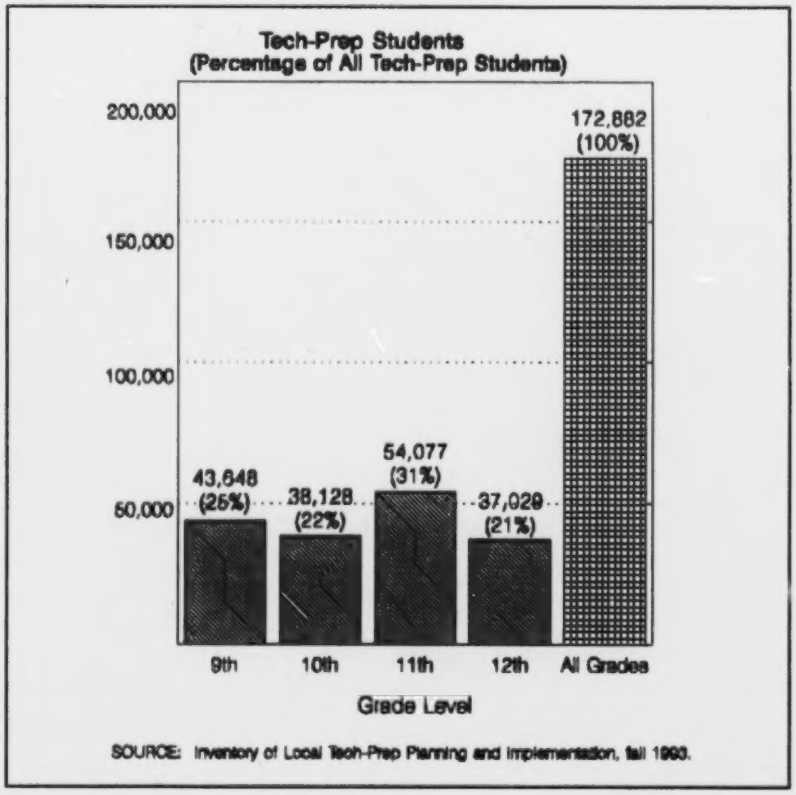
closely resembles participation in a program of study--choosing Tech-Prep, completing a student plan, and taking both applied academic and vocational courses. These 49 consortia accounted for 35,655 students, or 21 percent of all Tech-Prep participants reported. On the other hand, nearly 3,000 students in 11 consortia were counted as Tech-Prep participants based solely on their enrollment in one or more applied academic courses.

Tech-Prep participants are spread across grade levels

Although the federal legislation focused on promoting Tech-Prep programs that incorporate secondary grades 11 and 12, many students were reported as participating in Tech-Prep in the lower grades of high school (Figure VI.2). Approximately three-fourths of consortia reporting participation, or approximately 25 percent of consortia overall, included student enrollments in grades 9 and 10 in their counts. Of the reported 172,882 students in Tech-Prep in FY 1993, 25 percent were in the 9th grade, and 22 percent were in the 10th grade. The proportions of Tech-Prep participants in each grade were surprisingly similar, given the guidance contained in the federal legislation.

FIGURE VI.2

TOTAL REPORTED PARTICIPATION IN TECH-PREP, BY GRADE LEVEL



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

The distribution of students across grade levels probably reflects practices for enrolling new Tech-Prep students. Most Tech-Prep programs begin to formally identify or "enroll" students when the students enter either 9th grade or 11th grade.[4] Each year that a consortium reports participation it will report students in a new cohort (either 9th or 11th grade). However, some attrition between the first and subsequent years of the program (from 9th grade to 10th grade, or from 11th grade to 12th grade) could be expected. Therefore, it is possible that more Tech-Prep students will always be reported in the 9th than in the 10th grade, and in the 11th grade than in the 12th grade.

Tech-Prep students are distributed unevenly across the nation

Consortia in the South and in suburban areas reported large shares of Tech-Prep participants in FY 1993 (Figure VI.3). More than 106,000 students in the South were reported as in Tech-Prep in the 1992-1993 school year. Although this figure represented 62 percent of all reported Tech-Prep students that year, the South accounted for only 46 percent of all consortia and 35 percent of all secondary students in the United States. Slightly more than 12,000 Tech-Prep students (about 7 percent of the total number of Tech-Prep participants) were reported by consortia in the Northeast. The Midwest and West regions each reported approximately 27,000 Tech-Prep students, or 16 percent of the total.

Even more pronounced were differences in the distribution of participants by metropolitan status. Suburban consortia reported enrolling 68 percent of all Tech-Prep students in SY 1992-1993, although they accounted for only 46 percent of all consortia. Urban consortia represent 12 percent of all consortia but reported 7 percent of the total number of participants. Rural consortia accounted for one-fourth of the Tech-Prep students, but 42 percent of all consortia.

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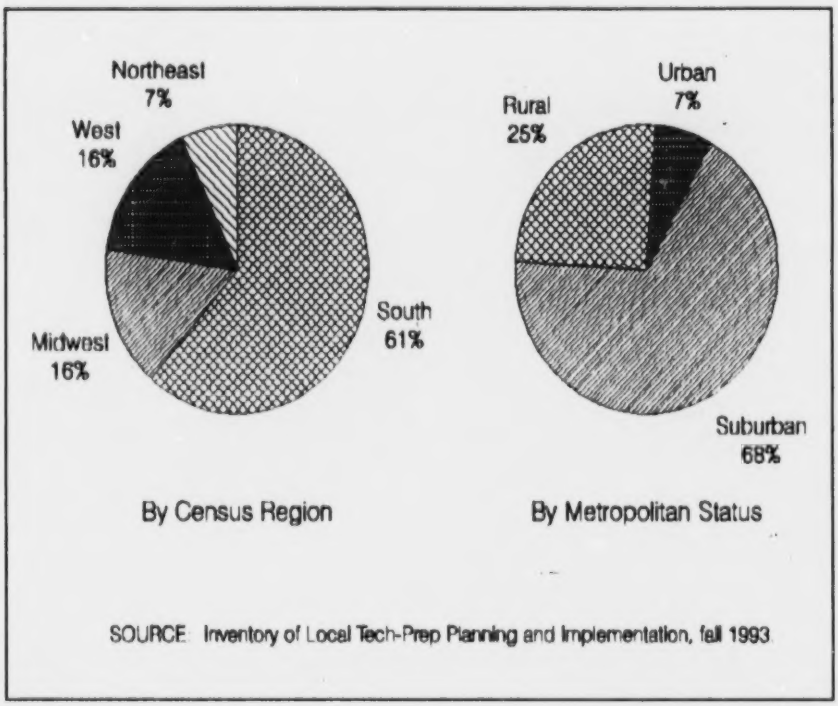
[4]Sixty percent of the consortia reported including "3 or more years of high school" as part of the program model. We are not able to distinguish between those that formally begin to identify students in 9th grade and in 10th grade. However, anecdotal evidence and discussions with Tech-Prep coordinators suggest that programs are more likely to begin in 9th grade than in 10th grade. Forty percent of consortia coordinators reported that their Tech-Prep programs begin in 11th grade.

FIGURE VI.3

DISTRIBUTION OF REPORTED TECH-PREP STUDENTS, BY GEOGRAPHIC LOCATION



Tech-Prep students currently are a small proportion of the secondary school population

In FY 1993, when federal support for Tech-Prep was in its second year, reported participation represented a very small fraction of the total secondary student population. In some states where consortia actually reported on Tech-Prep participation, Tech-Prep students accounted for as little as under one percent of all secondary students in their consortium districts, but in other states they accounted for as much as 70 percent (Table VI.3). Across all consortia that reported participation nationwide, Tech-Prep students represented 4.7 percent of all secondary students in their districts.[5] This figure could be regarded as an upper bound estimate of the proportion of all secondary students in consortia districts who were involved in Tech-Prep, if we assume that consortia that did not report on participation had students involved in Tech-Prep at comparable rates but were simply unable to collect participation data. A lower bound estimate of

[5]The estimates of Tech-Prep representation in the secondary student population are approximations because of data constraints. Data on district enrollments were based on the 1991-1992 school year, whereas Tech-Prep participation was reported for the 1992-1993 school year. We compared the number of Tech-Prep students with the number of all students in grades 9 through 12, even though some consortia do not include the early grades of high school in the program model.

TABLE VI.3

REPORTED TECH-PREP PARTICIPATION AS A SHARE OF ALL SECONDARY STUDENTS, BY STATE

State	Total Number of Tech-Prep Secondary Students	Percentage of Consortia Reporting Participation	Tech-Prep Students as a Percentage of All Secondary Students in Reporting Consortia
Alabama	6,205	52	9
Alaska	0	0	--
Arizona	3,038	40	6
Arkansas	1,248	62	6
California	260	2	4
Colorado	245	23	1
Connecticut	497	56	1
Delaware	0	0	--
District of Columbia	67	100	0
Florida	7,552	56	4
Georgia	16,514	30	34
Hawaii	0	0	--
Idaho	0	0	--
Illinois	1,513	32	2
Indiana	5,240	62	3
Iowa	747	60	8
Kansas	54	33	1
Kentucky	6,497	34	19
Louisiana	4,395	42	6
Maine	89	17	1
Maryland	6,945	53	6
Massachusetts	3,435	67	8
Michigan	13,532	19	29
Minnesota	601	17	14
Mississippi	82	7	5
Missouri	0	0	--
Montana	24	33	1
Nebraska	388	83	1
Nevada	1,288	100	2
New Hampshire	0	0	--
New Jersey	1,289	53	2
New Mexico	852	60	4
New York	2,351	46	0
North Carolina	17,138	55	21
North Dakota	0	0	--
Ohio	0	0	--
Oklahoma	933	40	4
Oregon	19,443	57	71

TABLE VI.3 *(continued)*

State	Total Number of Tech-Prep Secondary Students	Percentage of Consortia Reporting Participation	Tech-Prep Students as a Percentage of All Secondary Students in Reporting Consortia
Pennsylvania	3,154	28	3
Rhode Island	1,256	100	5
South Carolina	16,320	63	14
South Dakota	0	0	--
Tennessee	4,638	71	2
Texas	17,125	52	3
Utah	760	38	1
Vermont	30	25	0
Virginia	165	10	0
Washington	170	7	4
West Virginia	495	36	4
Wisconsin	5,244	42	6
Wyoming	799	33	21
Puerto Rico	260	100	0
Virgin Islands	0	0	--
Total	**172,882**	**36**	**4.7**

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

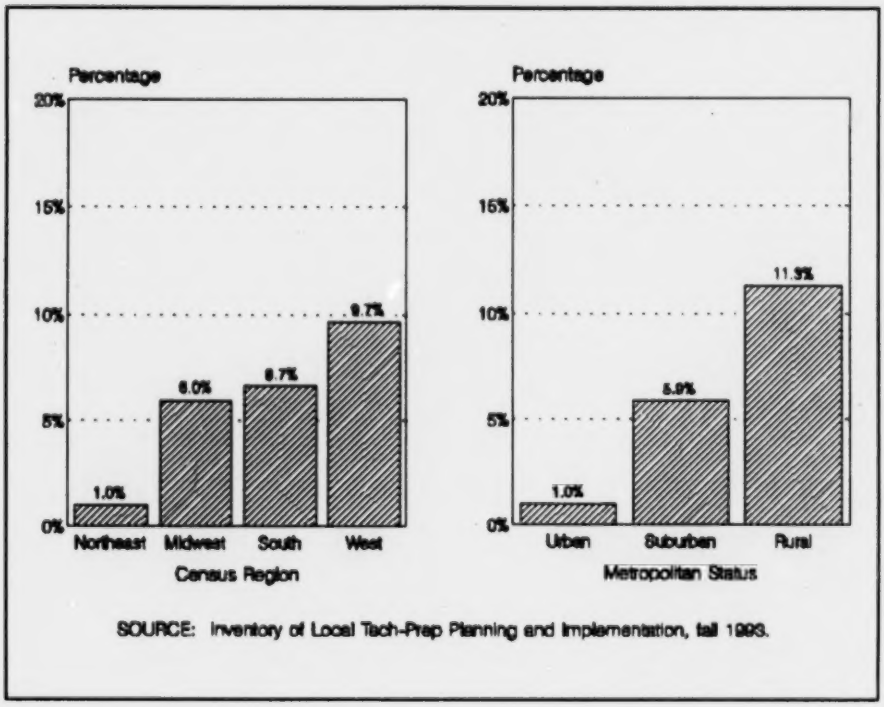
NOTE: Two dashes (--) indicate no Tech-Prep students were reported by consortia in the state; thus a percentage of all students in reporting consortia could not be computed.

participation, alternatively, can be based on the assumption that consortia that did not report on participation had not yet begun to identify and count Tech-Prep students. Under this more plausible assumption, Tech-Prep students would represent somewhat less than two percent of all secondary students in districts that are part of Tech-Prep consortia.

Urban areas may be underserved by Tech-Prep. Tech-Prep participants account for a much smaller fraction of all secondary students within central city consortium districts than within districts in suburban or rural consortia (Figure VI.4). In consortia that reported on participation and were located primarily in urban areas, only 1 percent of high school students participated in Tech-Prep, compared with about 6 percent and 11 percent in suburban and rural areas, respectively.

FIGURE VI.4

REPORTED TECH-PREP PARTICIPATION AS A SHARE OF ALL SECONDARY STUDENTS IN CONSORTIA REPORTING PARTICIPATION



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Tech-Prep participants do not fully reflect the racial/ethnic composition of the overall student population in their consortium districts

The racial/ethnic composition of the Tech-Prep student population differs somewhat from that of other students in their school districts (Table VI.4). Compared with the general student population, Tech-Prep students are more likely to be white, and less likely to be members of a minority group. To a large extent, this difference is due to the relatively low rate at which

TABLE VI.4

RACIAL/ETHNIC DISTRIBUTION OF TECH-PREP AND OF ALL STUDENTS IN REPORTING CONSORTIUM DISTRICTS, BY METROPOLITAN STATUS
(Percent of Students)

	Urban		Suburban		Rural		All	
Racial/Ethnic Category	Tech-Prep Students	All Students in Districts	Tech-Prep Students	All Students in Districts	Tech-Prep Students	All Students in Districts	Tech-Prep Students	All Students in Districts
White	33.7	28.8	74.8	69.9	65.5	79.3	69.3	54.6
Black	17.9	35.5	14.2	16.1	28.2	15.4	18.1	23.7
Hispanic	45.9	27.9	8.8	11.2	3.9	2.9	10.4	16.9
Native American	0.6	0.5	0.7	0.4	1.7	1.8	1.0	0.6
Asian/Pacific Islander	1.9	7.3	1.4	2.4	0.7	0.6	1.2	4.2
Percentage of All Tech-Prep Students	7		68		25		100	
Percentage of All Students in Consortium Districts		40		49		11		100

students are reported to be participating in Tech-Prep in large urban areas that have large minority student populations.

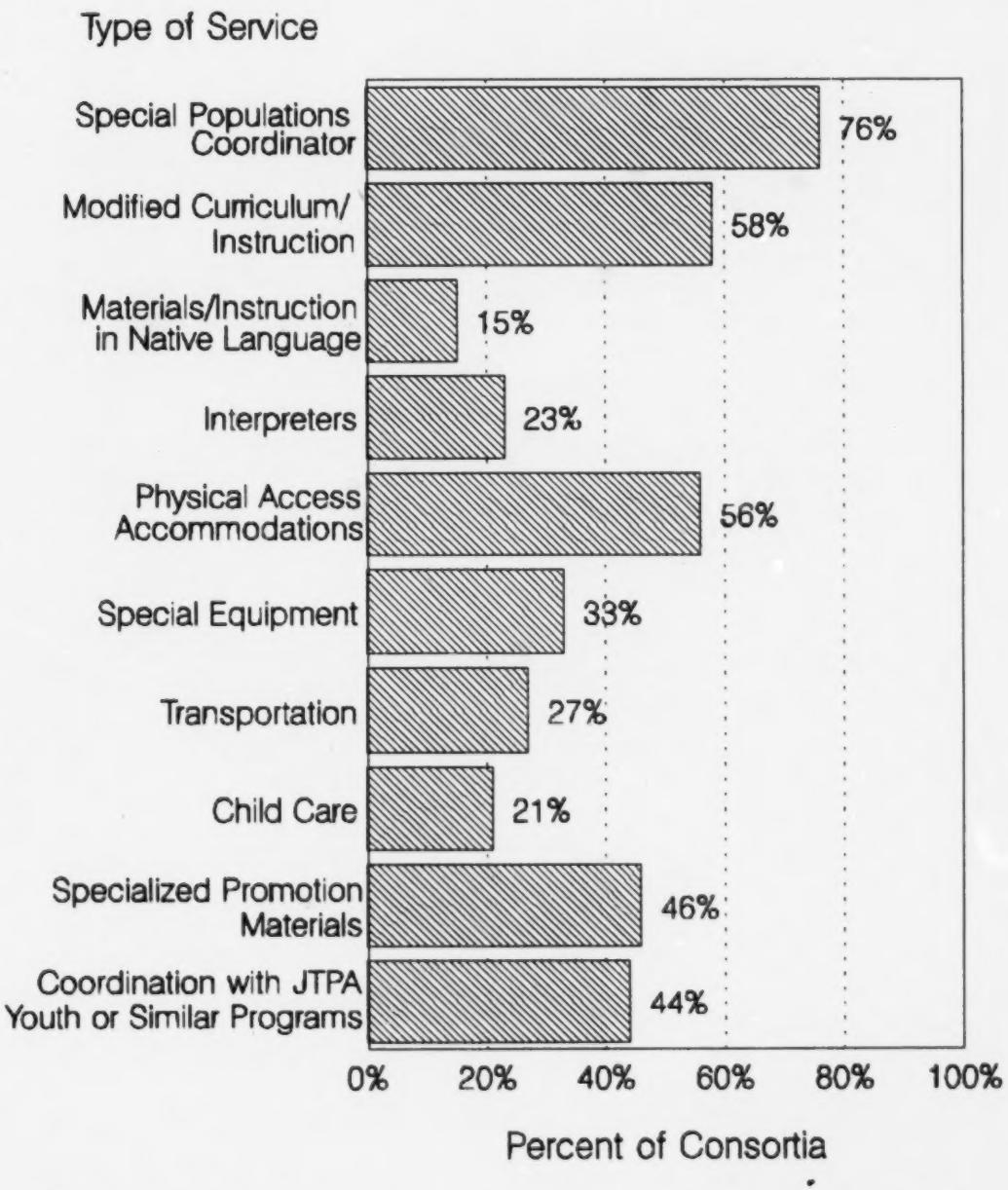
Most consortia are taking steps to increase access of special populations to Tech-Prep

Eighty-five percent of consortia reported instituting specific measures to facilitate access to Tech-Prep by members of special population groups--minorities, disadvantaged students, students with handicaps or hearing-impairment, and students with limited English language proficiency. The Perkins legislation mandates that localities ensure these groups' complete access to all programs funded under the act. Therefore, the high proportion of Tech-Prep consortia taking these steps is not surprising.

Consortia used a variety of services or made different accommodations to facilitate access to Tech-Prep (Figure VI.5). The most frequently reported approach (taken by more than 75 percent of consortia) is the inclusion of a special populations coordinator on the Tech-Prep team and/or in curriculum and staff development activities. Almost 60 percent of consortia reported modifying curriculum content or instructional methods to meet the special needs of a particular group, although the nature of these changes cannot be discerned from the survey data. Another 56 percent reported making physical access accommodations. Relatively few consortia reported providing support services directly (for example, transportation, child care, or interpreters).

FIGURE VI.5

CONSORTIA'S USE OF SERVICES OR ACCOMMODATIONS TO FACILITATE SPECIAL POPULATIONS' ACCESS TO TECH-PREP



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

VII. THE SCHOOL AND WORKPLACE CONTENT OF TECH-PREP PROGRAMS

A combination of challenging occupational instruction and rigorous, relevant academic education is at the heart of the Tech-Prep reforms. Title IIIE of the Perkins legislation stipulates that Tech-Prep program curricula should give students technical preparation and "build student competence in mathematics, science, and communications (including through applied academics) through a sequential course of study" that has an occupational focus. The legislation also emphasizes articulation agreements, to promote collaboration between secondary and postsecondary institutions in curriculum development and to provide students with a "nonduplicative sequence of progressive achievement leading to competencies."

Interest in work-based learning as a component of Tech-Prep has developed more recently, as a result of expected federal support under the School-to-Work Opportunities Act. This legislation promotes development of systems of career-oriented, integrated school curricula linked to structured training and other activities at a worksite. Tech-Prep consortia may figure heavily among partnerships seeking grants under the new legislation, because many proponents believe that Tech-Prep is the natural model for the school-based component of school-to-work systems and consider workplace experiences a logical extension of Tech-Prep. Many state and local Tech-Prep coordinators feel that successful implementation of Tech-Prep gives consortia an advantage in developing school-to-work systems.

This chapter describes the school-based and work-based activities that are available to Tech-Prep students. We first describe the occupational emphasis of Tech-Prep programs, including the use and focus of career clusters to guide course taking. Second, we discuss the development and implementation of new academic and vocational curricula at both the secondary and postsecondary levels. Third, we examine the extent and types of articulation that exist among consortium members. Fourth, we discuss the career development and guidance efforts undertaken by consortium schools. Finally, in the fifth section, we describe the workplace experiences available to Tech-Prep students.

THE OCCUPATIONAL EMPHASIS OF TECH-PREP PROGRAMS

A key component of the Tech-Prep model is a coherent sequence of courses designed to give students both the general and specialized skills necessary for entry into an identified career area. Ideally, these sequences include both vocational and academic courses to form a program of study that will prepare a student for a particular occupation. Choosing a program of study differs from choosing a traditional vocational course, because the selection of a program of study affects both academic and vocational courses. Broad career clusters--groupings of programs of study that prepare students for related occupations--can be used to frame students' initial options among general career directions, as a first step towards focusing on a particular occupation.

The content of the Perkins legislation (particularly Title IIIE) affirms the potential benefits of a program of study with an occupational theme. The legislation stipulates that Tech-Prep students should receive technical preparation in at least one of several broad fields (such as engineering technology, agriculture, health, or business), and that they do so as part of a program that promotes competence in both technical and academic areas.

The national survey included several questions to determine the extent of the occupational focus of Tech-Prep programs. Each consortium was asked in how many of its member districts *broad occupational/career clusters* had been defined and used to guide Tech-Prep students' course choices. The coordinators were then asked to identify the career clusters, and to report enrollments in the different clusters as of fall 1993.

Most Tech-Prep consortia report using career clusters, but understanding of the concept varies widely

Most consortia define career clusters. By fall 1993, clusters had been defined in at least one district in about two-thirds of the consortia (470 of 702). Fewer consortia make the choice of a career cluster part of the Tech-Prep experience, however. Only 229 of the 470 consortia make the choice of a broad career area a standard step in the core Tech-Prep program. Forty-seven consortia that make career clusters available to Tech-Prep students do not require that students select one.[1] Where career clusters exist but choosing one is not required, students generally choose a specific vocational program for a particular occupation, rather than first making a choice of a broader group of occupations. In these consortia, career clusters are more likely to serve as convenient categories for forming curriculum committees and for marketing programs, even if they are not prominent in students' decision-making.

It appears from the survey responses that understandings of the concept of a career cluster vary widely across consortia. The survey attempted to determine whether consortia had defined groupings or clusters of related occupations that could help build students' understanding of broad career areas. Counselors might use career clusters as a basis for guidance presentations, even if students only make choices among more specifically defined occupational programs. Alternatively, students might be expected to choose among broad career clusters as a basis for initial academic and vocational course planning, and then choose a more specific occupational program of study at a later point. About 20 percent of the survey respondents, rather than using the broad labels suggested in the questionnaire to describe their career clusters, wrote in quite specific cluster titles--such as building construction, child care, broadcasting, computer-assisted design, and occupational home economics. Such responses suggest that even many of the consortia that say they use broad career clusters are actually referring to specific occupational programs. These narrower occupational titles may in some cases refer to programs of study that specify both academic and vocational courses in an articulated program, or may in other cases refer simply to traditional vocational courses.

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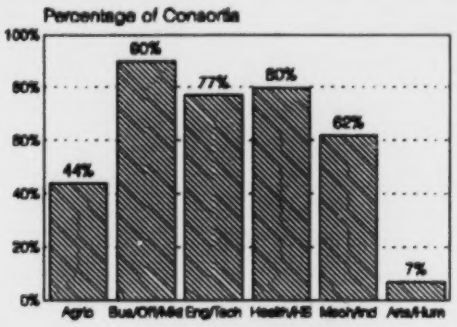
[1]The remainder of the 470 consortia (194) that make clusters available did not report core programs. Another 47 reported including career cluster choice as an element of the core program but also reported that none of their districts currently make clusters available. This contradiction probably indicates that some coordinators reported core programs that were "objectives," rather than established Tech-Prep program components.

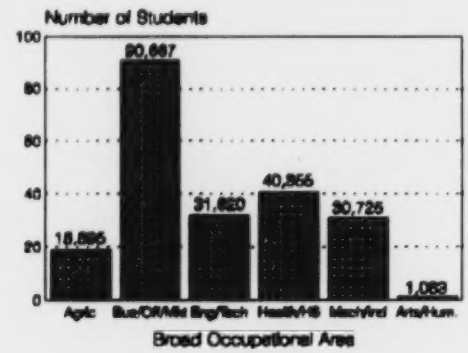
Career areas are most commonly defined in business, engineering/technology, and health and human services

Tech-Prep consortia most commonly defined a career cluster relating to business, office skills, and marketing (Figure VII.1). More than 90 percent of the consortia with career clusters have defined a cluster that includes these occupations. This broad cluster also had the largest enrollments, with more than 90,000 Tech-Prep students during fall 1993--or 42 percent of all students reported by career cluster.

FIGURE VII.1

PERCENTAGE OF CONSORTIA WITH SPECIFIED CAREER CLUSTERS AND NUMBER OF STUDENTS PARTICIPATING IN THESE CLUSTERS, FALL 1993





SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Defined clusters in engineering/technology and health and human services were also common. Although these clusters were almost as widely available among consortia as the business-related cluster, participation in them was lower. Engineering/technology and health and human services each accounted for less than half as many Tech-Prep students as were reported in the business, office skills, and marketing cluster. Participation in engineering/technology accounted for 15 percent of all student enrollment by cluster, and health and human services accounted for 19 percent.

An arts and humanities cluster has been established in a small number of consortia

Some consortia have gone beyond traditional vocational offerings as a basis for forming career clusters. Thirty-three consortia have defined a cluster that focuses on careers in the fine arts and humanities, deviating from the technology emphasis promoted by the Tech-Prep Education Act (Figure VII.1). These consortia represent only 7 percent of consortia with career clusters, and the cluster has enrolled only about 1,000 students overall.

Evidence from the in-depth studies, Tech-Prep literature, and the national survey suggests that schools that offer a liberal arts cluster such as "fine arts and humanities" provide a comprehensive set of clusters, and require all students to choose a cluster at some point during their secondary school experience. Consortia that have developed a liberal arts cluster offer a greater number of clusters than do other consortia. Whereas other common career clusters encompass many of the vocational courses that already exist in secondary schools, arts and humanities clusters must devise an occupational focus. These clusters tend to lack both a technology emphasis and a vocational component. Instead, they rely on electives in public speaking, art, music, journalism, and performance to develop competencies that may be relevant in students' future careers.

The occupational emphasis of Tech-Prep generally follows patterns of vocational course taking

We compared the reported participation of Tech-Prep students in career clusters to recent data from the National Assessment of Vocational Education on the percentage of students earning credits in various vocational program areas in 1990 (NAVE 1994). The comparison suggests that, in many ways, participation of Tech-Prep students in career clusters reflects the distribution of students in vocational program areas--but with some differences.

Overall patterns of participation are similar. The highest proportion of both Tech-Prep students and of vocational students overall were enrolled in the business area, and relatively few in both groups were enrolled in agriculture programs. Relative to the general student population, however, Tech-Prep students are more concentrated in health and human service-oriented programs (including home economics) and less concentrated in the mechanical, industrial, and practical trades (which are comparable to trade and industry vocational courses).[2] However, the NAVE also reports that more recent data suggest that overall student enrollments in health courses have been increasing.

DEVELOPMENT OF ACADEMIC AND VOCATIONAL CURRICULA

The Perkins legislation generally, and the Tech-Prep Education Act specifically, promote the integration of academic and vocational education and articulation between secondary and postsecondary course sequences to create programs of study around broad career themes. The act acknowledges that consortia may have to develop new curricula or modify existing ones in order to achieve these objectives.

Integrating academic and vocational education and developing course sequences may require fundamental changes to traditional educational approaches. Researchers have identified at least eight

[2]This difference may be partially explained by the fact that the NAVE data represent student enrollments at least two years behind those described by the national Tech-Prep data.

models of integration; some involve ambitious reforms in which entire high school curricula are restructured, and some involve only minor changes to existing courses. Evidence suggests that, although most schools have instituted only limited reforms, such as introducing off-the-shelf, commercial applied academic courses, these actions may be the first in a sequence of curriculum development efforts (Grubb et al. 1991).

The national survey explored two areas of curriculum development. First, we asked about the development of academic curricula that emphasize contextual or applied learning, differentiating curricula that were developed through local consortium or state efforts from those that were purchased from vendors. Applied academic courses are the most common approach to integrating academic and vocational education. Second, we collected data on new or substantially revised occupational or technical courses that emphasize new instructional methods or contents--such as competency-based learning, or upgrading to include more advanced skills.

Recent development and implementation of academic curricula for Tech-Prep has been widespread

Virtually all consortia implemented academic curricula that emphasized contextual or applied learning between 1991 and 1993. During that time, 94 percent of consortia (657 of 702) either introduced applied academic curricula that had been developed by local or state staff, or were using commercially acquired applied academic curricula.

Mathematics, science, and English/language arts were the focus of applied academic curriculum development and implementation. Title IIIE of the Perkins legislation emphasizes these three core subjects by stipulating that Tech-Prep programs "build competence in mathematics, science, and communications (including through applied academics)." Almost 75 percent of Tech-Prep consortia introduced some form of locally developed or state-developed applied mathematics in at least some of their schools (Table VII.1). More than half of the consortia established physics and/or English courses that emphasized contextual or applied learning. Applied curricula for other science subjects, such as biology and chemistry, were developed and implemented in more than 43 and 34 percent of all consortia, respectively. Far fewer consortia developed and implemented curricula with an applied approach for courses in economics or history. Use of commercial curricula in these different subject areas follows a similar pattern.

Consortia rely somewhat more heavily on commercially available curricula than on those developed at the local or state level

Consortia were somewhat more likely (89 percent) to purchase applied academics curricula than to use curricula developed at the state or local level (80 percent).[3] Heavier use of commercial curricula probably reflects the time required to develop new curricula or revise existing materials to emphasize contextual or applied learning. Although consortia that received their first Title IIIE grants in FY 1993 and FY 1992 were equally likely to use commercial products, the newer consortia were less likely to have implemented their own applied curricula.

[3]The vast majority of consortia--524 out of 702--introduced *both* commercially available applied academics curricula and curricula developed locally by consortium members or under state auspices.

TABLE VII.1

LOCALLY OR STATE-DEVELOPED APPLIED ACADEMIC CURRICULA
INTRODUCED WITHIN LAST TWO YEARS (1991-1993)

	Consortia		Secondary Schools		Postsecondary Schools[b]	
Subject Area	Number	Percentage	Number	Percentage[a]	Number	Percentage[a]
Biology	305	43	938	12	53	3
Chemistry	237	34	698	9	44	2
Mathematics	517	74	2,825	37	190	10
Physics	360	51	1,217	16	98	5
English and Other Language Arts	439	63	2,121	28	141	7
Economics	53	8	144	2	7	0
History	25	4	77	1	3	0
Other	125	18	255	3	65	3
None	140	20	--	--	--	--

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

[a]The denominators used in calculating the percentages are the sums of the reported number of secondary schools and postsecondary schools, respectively, in consortia implementing applied curricula in the specified subject area.

[b]Includes community and technical colleges, four year colleges and universities, proprietary schools, and registered apprenticeship programs in each reporting consortium.

Applied academic curricula are adopted gradually within consortia

Consortia do not generally implement all Tech-Prep program elements in all member schools at the same time. Each school must hire or train staff, purchase new materials or equipment, and modify course schedules. Consequently, consortia may concentrate their early efforts on developing new curricula for implementation in a few schools and subject areas. Even within schools, not all students in the target group initially may have access to all program curricula. We would also expect consortia to focus their efforts on implementing curricula in the grades in which Tech-Prep students are currently enrolled or about to enter. In most consortia this might mean at first devoting less attention to postsecondary curricula than to high school curricula.

The survey data suggest, indeed, that many consortia are implementing new curricula in stages. Although substantial proportions of consortia had established applied academic curricula in several subject areas, they had introduced the new curricula in relatively few member schools (Table VII.1). Applied mathematics, for example, has been implemented in 74 percent of consortia, but in only 37 percent of the schools in those consortia. Consortia that implemented applied curricula in other subject areas have done so in even fewer schools. However, fuller implementation of applied academic curricula may be a matter of time. FY 1992 grantees were not only more likely than more recent grantees to be implementing new applied academic curricula (83 percent compared with 72 percent), but were also implementing these curricula in a higher proportion of their schools. It should be remembered, however, that even within schools, new curricula are likely to be adopted and affect students' classes gradually.

The data also confirm that consortia have focused most of their curriculum development efforts on the secondary level. In fall 1993, relatively few consortia that had developed new academic curricula emphasizing contextual learning had actually implemented those curricula at the postsecondary level (Table VII.1). Proportionally twice as many secondary schools as postsecondary institutions had introduced locally developed or state-developed applied academic curricula.[4] The survey also indicates that commercial products, the most popular of which are targeted primarily to secondary students, are being implemented in an even smaller proportion of postsecondary institutions.

However, the lesser emphasis on new curricula at the postsecondary level may reflect program design decisions, rather than a gradual approach to implementation. The stage of student activity does not appear to affect the extent of curriculum implementation at the postsecondary level; consortia that have Tech-Prep students entering postsecondary institutions were introducing new curricula at somewhat lower proportions of these institutions than were other consortia.

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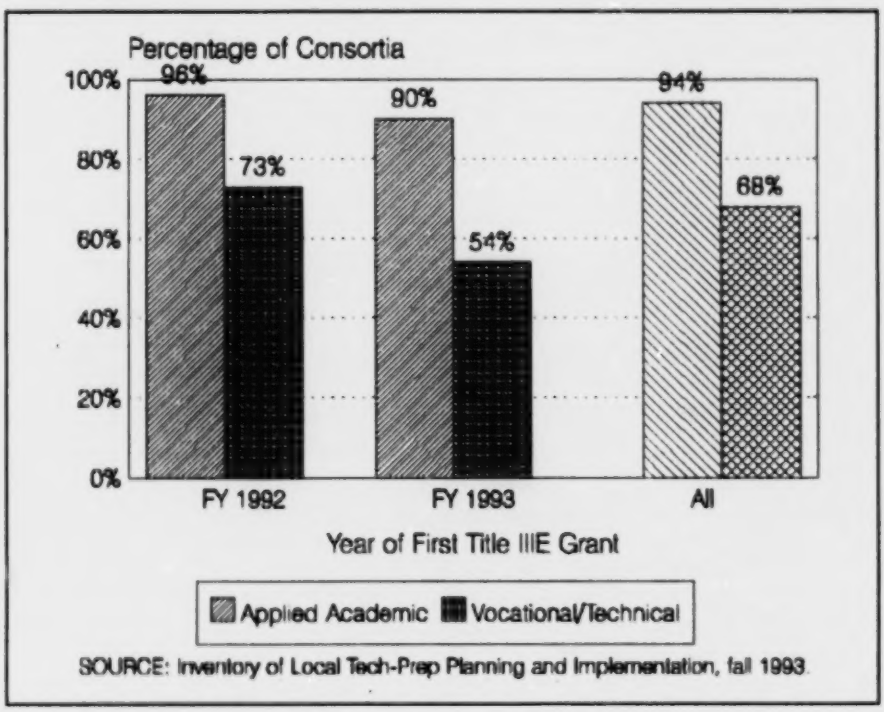
[4]For calculation of the percentages of secondary schools and postsecondary institutions implementing applied academic curricula (reported in Table VI.1), the denominator was the number of institutions in consortia that reported developing applied curricula in the specific subject area. The percentage of *all* secondary schools or *all* postsecondary institutions that have developed new curricula is significantly smaller.

Implementation has so far emphasized applied academic curricula more heavily than vocational-technical curricula

Consortia are more likely to have developed and/or implemented new applied academic curricula than updated vocational-technical curricula (Figure VII.2). Between 1991 and 1993, more than 650 of the 702 consortia (94 percent) introduced new academic curricula, compared with 475 consortia (68 percent) that introduced new or revised occupational/technical curricula. The focus on applied academics may reflect a first stage of curriculum activity. The data suggest that developing technical curricula is generally not a priority in the early years of Tech-Prep implementation. Consortia that received their first Title IIIE grant in FY 1992 were more likely than those that received their first grant in FY 1993 to be implementing new or revised curricula of either type--academic or vocational. However, higher proportions of both older and newer grantees implemented academic curricula than vocational curricula.

FIGURE VII.2

RECENT INTRODUCTION OF NEW APPLIED ACADEMIC AND OCCUPATIONAL-TECHNICAL CURRICULA BY YEAR OF FIRST GRANT



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993

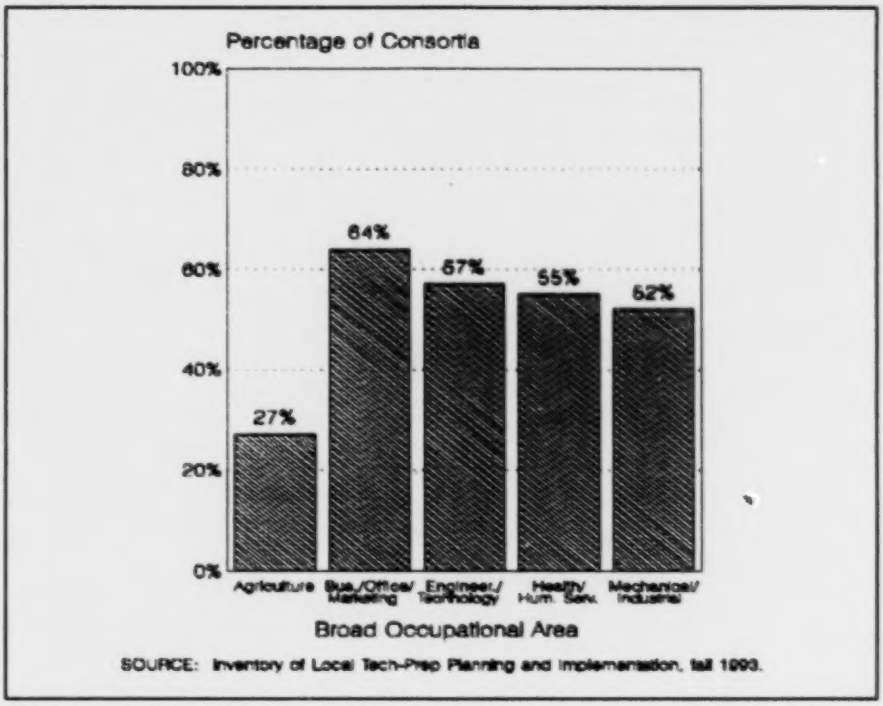
Development of vocational curriculum follows a pattern similar to that of career clusters

Consortia have emphasized technical curriculum activity in the same occupational areas in which they offer career clusters. Consortia that developed and implemented new occupational curricula between 1991 and 1993 focused most of their attention on courses in the business, office skills,

and marketing cluster (Figure VII.3). More than 300 consortia (64 percent of those implementing new vocational curricula) introduced new or substantially revised courses related to this broad career cluster. More than 250 consortia (more than 50 percent) developed curricula within each of three other general occupational areas--engineering technology, health/human services, and mechanical/industrial/practical art or trade. Consortia focused their vocational curriculum development efforts least on agriculture.

FIGURE VII.3

RECENT IMPLEMENTATION OF NEW OCCUPATIONAL-TECHNICAL CURRICULA AT THE SECONDARY LEVEL, BY BROAD OCCUPATIONAL AREA



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

ARTICULATION OF SECONDARY AND POSTSECONDARY PROGRAMS

Articulation agreements are specifically required under the Perkins legislation as a key component of any Tech-Prep program receiving a Title IIIE grant. Articulation agreements promote coordination between secondary and postsecondary institutions to eliminate unnecessary redundancies in course work across institutions and, where possible, to facilitate collaboration on curriculum development and ongoing working relationships. Because such agreements have been in place in many localities for years before the Tech-Prep legislation, they have often served as a starting point for implementation of Tech-Prep.

Articulation agreements take a variety of forms. *General agreements* between secondary and postsecondary institutions involve only the broad principle of cooperation and collaboration, or the general concept of the transfer of credit. They often are the starting point for developing *specific articulation agreements* that focus on particular occupational specialties. Specific agreements may include details on the specific conditions for transfer of credit or other matters, such as joint teaching arrangements or guarantees of space for students entering particular postsecondary programs. Ideally, the agreements articulate secondary and postsecondary *programs*, to create comprehensive pathways with increasing specialization and skill levels. However, some agreements focus more narrowly on articulating individual courses offered at both the secondary and postsecondary levels, either as a substitute for or a first step towards articulation of programs.

Regardless of the form of the agreements, articulation has several advantages for both students and participating institutions. By encouraging students to earn college credits while in high school, articulation can promote entry into postsecondary programs. By eliminating duplication of course content across secondary and postsecondary institutions, and by granting advanced placement in postsecondary programs, articulation can help students to complete their postsecondary program in less time. Eliminating course redundancy allows students to take more advanced courses as part of their postsecondary degree or certificate program, and to enter employment at a higher skill level. Finally, postsecondary institutions may benefit from increased student enrollments and the opportunity to reduce the number of remedial and lower-level classes they must offer.

Questions designed to document articulation efforts were an important element of the national Tech-Prep survey. We asked consortium coordinators whether secondary and postsecondary institutions that were members at the time of the survey had signed any articulation agreements before the Tech-Prep consortium had been established, and within the two years preceding the survey. Coordinators were also asked to record the number of postsecondary institutions that have articulation agreements with the secondary schools in the consortium, the occupational specialties that were articulated, and the broad career categories into which each specialty fell.

Many states had a track record of articulation before their implementation of Tech-Prep

Articulation existed in many communities before Tech-Prep consortium development (Table VII.2). In 17 states, at least 80 percent of the consortia reported having articulation agreements before Tech-Prep. In 38 states, more than half of the consortia had pre-existing agreements. Rural consortia were less likely to have pre-existing agreements (44 percent) than were either urban or suburban consortia (about 70 percent), probably because access to community colleges is more limited in rural areas.

Older grantees were more likely than recent grantees to have had pre-existing articulation agreements among consortium members (62 percent compared with 52 percent). This result accords with the NAVE finding that many districts that received early Title IIIE grants had implemented Tech-Prep or components of it before receiving grant funds (NAVE 1994, p. 359). Because articulation is a key and easily defined component of Tech-Prep, and Title IIIE grants generally were awarded competitively, districts and colleges that had pre-existing articulation agreements may have been most likely to receive Tech-Prep funding in the early cycle of the grant program.

TABLE VII.2

CONSORTIA WITH ARTICULATION AGREEMENTS SIGNED PRIOR TO TECH-PREP IMPLEMENTATION AND WITHIN THE LAST TWO YEARS (1991-1993), BY STATE

State	Number of Consortia[a]	Percentage of Consortia With	
		Articulation Agreements Signed Before Tech-Prep	Recent Articulation Agreements Signed In Last Two Years
Alabama	27	26	67
Alaska	2	0	50
Arizona	15	67	80
Arkansas	13	38	100
California	44	91	73
Colorado	13	54	69
Connecticut	9	67	67
Delaware	1	100	100
District of Columbia	1	0	100
Florida	16	81	94
Georgia	46	26	76
Hawaii	4	100	50
Idaho	6	50	83
Illinois	28	82	71
Indiana	13	85	46
Iowa	5	60	100
Kansas	6	83	67
Kentucky	38	16	82
Louisiana	12	33	100
Maine	6	67	67
Maryland	15	93	87
Massachusetts	9	78	100
Michigan	37	76	57
Minnesota	18	28	67
Mississippi	14	21	86
Missouri	12	67	83
Montana	3	0	67
Nebraska	6	67	100
Nevada	3	0	100
New Hampshire	2	50	100
New Jersey	15	80	87
New Mexico	10	20	70
New York	26	46	73
North Carolina	42	48	81
North Dakota	1	100	0
Ohio	13	85	46
Oklahoma	10	40	70
Oregon	7	71	71
Pennsylvania	18	67	72
Rhode Island	1	100	100
South Carolina	16	100	88
South Dakota	4	25	25
Tennessee	14	43	64

TABLE VII.2 *(continued)*

State	Number of Consortia[a]	Percentage of Consortia With: Articulation Agreements Signed Before Tech-Prep	Percentage of Consortia With: Recent Articulation Agreements Signed In Last Two Years
Texas	25	76	100
Utah	8	75	75
Vermont	4	50	75
Virginia	21	81	48
Washington	15	80	33
West Virginia	11	91	64
Wisconsin	12	92	83
Wyoming	3	67	67
Puerto Rico	1	0	100
Virgin Islands	1	0	0
Total	**702**	**59**	**74**

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

[a]Based on survey respondents.

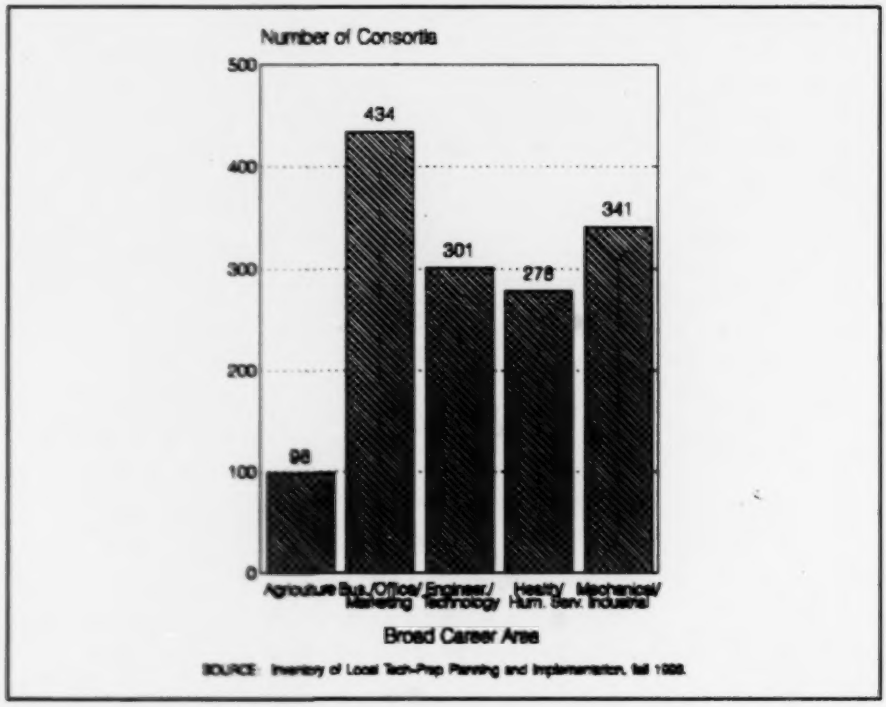
Recent Tech-Prep activity reflects continued emphasis on articulation

During the first several years of Tech-Prep funding, consortia made substantial efforts to develop or update articulation agreements. Many consortia in states in which articulation agreements had not been developed before Tech-Prep, (for example, Alabama, Georgia, Louisiana, Minnesota, Mississippi, and New York), did so between 1991 and 1993 (Table VII.2). Consortia that had pre-existing agreements (for example, those in California and Maryland), continued to sign agreements, either to develop articulation in new occupational specialties, or to expand to include new consortium members (or both). Consortia in the south were least likely to have had pre-existing articulation agreements, but were most likely to have developed agreements recently.

Most of the recent articulation activity has been in occupational fields related to business and mechanical/industrial trades (Figure VII.4). Of the 527 consortia with articulated specialties, 434 (82 percent) reported articulation of at least one course or program related to business. Nearly 65 percent of the consortia (341 of 527) reported an articulated specialty that would fall within the areas of mechanical, industrial, practical art, or trade.

FIGURE VII.4

NUMBER OF CONSORTIA REPORTING SPECIFIC ARTICULATION AGREEMENTS, BY BROAD CAREER AREA OF THE AGREEMENTS



Many postsecondary institutions are involved in articulation efforts

In the majority of Tech-Prep consortia, secondary school members currently have articulation agreements with at least one postsecondary institution. Approximately 30 percent of the consortia have specific articulation agreements with more than one postsecondary institution. Consortia that had signed specific articulation agreements reported a total of 979 postsecondary institutions as partners in these agreements. This figure represents about half of all postsecondary institutions that were reported as members of those consortia.[5]

Although we did not ask consortium coordinators to report the *types* of postsecondary institutions involved in articulation agreements, it appears that most are community, technical, or junior colleges. Such institutions represent the vast majority of postsecondary consortium partners. Moreover, discussions with state and local Tech-Prep coordinators suggest that articulation with four-year colleges and apprenticeship programs is much less common. If all, or most, of the 979 postsecondary institutions reported as articulation partners are two-year colleges, then Tech-Prep has affected most of the nation's community colleges.[6] However, some postsecondary institutions develop articulation agreements with districts or schools in multiple consortia. We suspect, therefore, that the sum of the number of postsecondary institutions with articulation agreements reported by consortia is not an unduplicated count and that the actual number of postsecondary institutions involved in articulation is somewhat lower.

Granting credit is the most common provision of articulation agreements

Specific articulation agreements usually stipulate the objectives, requirements, and activities of the arrangement between secondary and postsecondary partners. Establishing the conditions for granting college credit is the most common provision. Of the 702 Tech-Prep consortia, 556 (almost 80 percent) had developed agreements identifying the secondary courses or competencies for which postsecondary credits could be granted, or that would enable students to skip prerequisites or introductory courses at the postsecondary level (Table VII.3). The in-depth studies confirm that the goal of many articulation agreements is to grant college credit for courses or course sequences that cover material comparable to courses offered at the postsecondary institutions.

Articulation agreements also involve curriculum development or realignment (Table VII.3). In 300 to 400 consortia, articulation agreements provided for changing the competencies that are covered in postsecondary courses that are components of an occupational sequence (43 percent), or that are covered in secondary courses (53 percent). Changes in postsecondary courses are most likely aimed at upgrading the level of skills covered to take account of anticipated improvement in students' preparation in high school. In 59 percent of all consortia, articulation agreements specified collaboration between the partners to identify a sequence of required and elective courses or competencies at the secondary and postsecondary levels to create a four-year program of study. This finding may provide some indication of the extent to which consortia are working towards program articulation.

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[5]By "postsecondary institutions," we mean the sum of the reported number of community, junior, and technical colleges; four-year colleges and universities; proprietary schools; and registered apprenticeship programs in each consortium.

[6]The NAVE reports that in spring 1992, there were 992 public two-year institutions (typically what we refer to as community colleges).

TABLE VII.3

EXTENT AND SCOPE OF ARTICULATION AGREEMENTS

	Consortia		Postsecondary Institutions[a]	
Specific Articulation Agreement Provisions	Number	Percentage	Number	Percentage
Establishing Conditions for Granting Credit	556	79	871	46
Revising Postsecondary Courses	300	43	455	24
Revising Secondary Courses	373	53	582	31
Granting Advanced Standing in Apprenticeship	88	13	125	7
Providing Joint/Exchange Teaching	126	18	168	9
Defining Secondary/Postsecondary Course Sequences	417	59	672	35
Ensuring Tech-Prep Graduates Slots in Postsecondary Schools	180	26	244	13

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

NOTE: This table provides two alternative measures of the prevalence of particular provisions in articulation agreements. First, it shows how many *consortia* there are where agreements include each provision. Second, it shows how many *postsecondary institutions* are involved in agreements including each provision. The two differ largely because the number of postsecondary institutions in a consortium often exceeds one.

[a]The denominator used in calculating the percentage is the sum of the reported number of community and technical colleges, four-year colleges and universities, proprietary schools, and registered apprenticeship programs in each consortium reporting an agreement in the specified category.

Articulation often focuses on courses, rather than on programs

Although many consortia may have program articulation as their objective, current articulation agreements appear to link individual courses rather than comprehensive programs of study. Five hundred and twenty-seven consortia have articulated at least one occupationally oriented course or program; coordinators in these consortia provided many titles of programs or courses for which articulation agreements had been developed. Their lists suggest that articulation of courses rather than of programs of study may predominate. However, there also appeared to be some confusion in reporting of the specific areas of articulation.

The national survey asked consortium coordinators to list the "occupational specialties" for which specific articulation agreements had been signed, and to identify the broad career area into which each specialty could best be classified. By occupational specialty we meant the postsecondary degree or certificate for which the Tech-Prep program was preparing participating students. Ideally, students who are in Tech-Prep plan a four-year program that includes specialized technical education at the postsecondary level. Therefore, we were interested in determining the extent to which consortia were articulating defined occupational programs.

However, there was clearly some ambiguity about the term "occupational specialty," as few coordinators reported a title that indicated a specific certificate or degree program at the postsecondary level. Despite the intent of the survey question, many coordinators appeared to list all courses or programs for which articulation agreements had been signed, including both occupational-technical and academic subjects.[7]

Recent research has noted that many Tech-Prep consortia have so far pursued articulation of courses, rather than programs of study (NAVE 1994; and Ascher and Flaxman 1993). The national survey results confirm this finding. The titles of many reported "occupational specialties" were too narrow to reflect a program theme at either the secondary or postsecondary level. Examples include Suspension and Steering, AC Circuits, Keyboarding, Machine Shop, Financial Records, Teacher Assisting, and Turf Grass Operations. Some titles clearly reflected a course numbering system or hierarchy, such as Office Procedures I and II, Electronics I, Introduction to Business, Introduction to Spreadsheets. Some titles were very general and identical to familiar introductory vocational courses (for example, Health Occupations, Principles of Business, and General Technologies).

Whether other responses pertain to courses or programs is often unclear. Many occupational titles listed by consortium coordinators are common vocational courses, but possibly represent a degree or certificate program at the postsecondary level. The titles do not allow us to distinguish between simple articulation of vocational courses and articulation of sequences of academic and technical courses with an occupational focus. More than three thousand articulation agreement titles were recorded by consortium coordinators. Among the most frequently reported titles of articulation were Marketing, Welding, Drafting, Electronics, Horticulture, Accounting, Office Systems, Child Care/Early Childhood Education, Machine Tool Technology, Automotive Technology, Nursing, and Office Systems.

[7]Articulation agreements for academic courses, such as chemistry, physics, and algebra, were eliminated from the calculations.

CAREER DEVELOPMENT AND GUIDANCE

Career development and counseling are likely to be critical to the success of Tech-Prep programs.[8] Many students who are considered to be in a Tech-Prep program must make important choices--enrolling in Tech-Prep, selecting a career cluster, identifying a vocational major, entering postsecondary education for a specialized degree or certificate, and seeking and obtaining employment. Therefore, Tech-Prep students must be able to identify their interests and abilities, and to choose occupational goals on the basis of information about and exposure to the variety of career options available. Career counseling and related career development activities may be provided specifically as a component of a Tech-Prep program, may be requirements that all students in a school must engage in according to a prescribed sequence, or may be available to any student who wishes to make use of them.

As part of the national survey, we explored the types of career development activities that consortium members had implemented. To determine the extent to which these activities had been implemented across the consortia, we asked coordinators to indicate whether the activities were available at any, some, or all schools in the consortium; these questions were asked separately for middle school, high school, and postsecondary years. It is important to note that the questions did not ask about activities conducted *solely* for Tech-Prep students.

Individual career counseling is widespread but not universally available

Many schools involve students in individual counseling sessions as a way of promoting career awareness, and those in Tech-Prep consortia are no exception. About 90 percent of the 702 consortia conduct individual career-counseling sessions in some or all of their member high schools of all consortia. However, only 56 percent of all consortia conducted this activity in *all* of their participating high schools (Table VII.4).

The definition and delivery of career development remains largely a matter for individual districts and schools

Neither consortium structure nor Tech-Prep may greatly affect career-development activities. Career-development activities were implemented consortium-wide in fewer than half of the consortia. Although many consortia reported including career-development classes or sessions in their core programs, they do not conduct these activities in all member secondary schools. For example, only 35 percent of the consortia that reported implementing career-development classes as part of the core Tech-Prep experience had implemented these in all member schools. Instead, the availability of career-development activities is more likely left to schools and districts to determine.

As a result, consortium staff may have difficulty obtaining concrete information about the extent and types of these activities in each school. About 50 consortia coordinators were unable to answer *any* questions in the fall 1993 survey about career-development activities in grades 8 or earlier, 18 were unable to answer any questions about activities in grades 9-12, and 38 consortia

[8]Although Title IIIE of the Perkins Act does not explicitly call for career development and counseling, it does call for preparatory services, which are generally viewed as including these functions.

TABLE VII.4

CONSORTIA PROVIDING CAREER DEVELOPMENT AT ALL MEMBER SCHOOLS

Activity Type	Grade 8 or Earlier		Grades 9 to 12		Postsecondary Level		Total	
	Number of Consortia	Percentage	Number of Consortia	Percentage	Number of Consortia	Percentage	Number of Consortia	Percentage
Special Career Development Classes	140	20	164	23	223	32	343	49
Career Development Integrated in Academic or Vocational Classes	145	21	264	38	265	38	394	56
Individual Counseling	203	29	343	49	390	56	500	71
Special Tech-Prep Counseling Materials	119	17	193	28	126	18	243	35
Development of Secondary\ Postsecondary Student Plans	119	17	233	33	219	31	319	45
Career Exploration Software	143	20	266	38	346	49	442	63
Trips to Work Sites	63	9	151	22	225	32	301	43
Job Placement by Course Instructors	NA		126	18	273	39	313	45
Job Placement by Guidance Counselors	NA		117	17	222	32	259	37
Job Placement by Special Placement Staff	NA		76	11	296	42	327	47
Other	9	1	5	1	5	1	9	1

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, Fall 1993.

NOTE: NA means not applicable.

could not answer any questions about activities at the postsecondary level. In addition, many coordinators lacked information about the conduct of activities in specific categories. Coordinators were most frequently unable to answer questions about special career-development classes, school counselors' use of special counseling materials developed specifically for Tech-Prep students, students' access to career-exploration software, and job-placement efforts.

Placing students in jobs is not currently a major strategy for career development at the secondary level

Few consortia provide job-placement assistance (Table VII.4). Less than 30 percent of the consortia provide some type of secondary job-placement assistance consortium-wide.[9] In responding to survey questions about job-placement assistance, consortium coordinators may have included both informal placement help provided by vocational counselors and more structured assistance provided by special staff given assigned responsibility for this task. The responses also included districts that offer temporary jobs as part of the secondary school cooperative education program.

WORKPLACE OPPORTUNITIES FOR TECH-PREP STUDENTS

Facilitating students' entry into career-oriented employment is considered a key Tech-Prep objective and component. Title II E of the Perkins legislation encourages training of counselors to promote students' placement in appropriate employment. It also requires state agencies to give special consideration to grant applications that "provide for effective placement activities," although it does not specifically require a workplace learning component.

Although the obvious intent of these provisions was to encourage students' transition to work after their completion of a Tech-Prep program, some consortia now consider workplace experiences during school as a useful feature of Tech-Prep programs. Some consortia are focusing resources on developing the capacity to place students at a worksite as part of a Tech-Prep program. Others rely on existing cooperative education or work-study programs as a structure for making work experiences available to interested students. The availability of grants under the School-to-Work Opportunities Act to expand systems of work-based learning will likely encourage increasing numbers of Tech-Prep consortia to turn their attention to this component.

The national survey examined several issues about the availability of workplace experiences for Tech-Prep students. Coordinators reported the number of districts offering each of several types of workplace opportunities, and the staff or organizations generally responsible for worksite placements. Coordinators' responses should not be interpreted as a measure of the *intensity* of workplace experiences in Tech-Prep, because the survey did not collect data on the number of Tech-Prep students who actually participated in these experiences or the duration of their participation.

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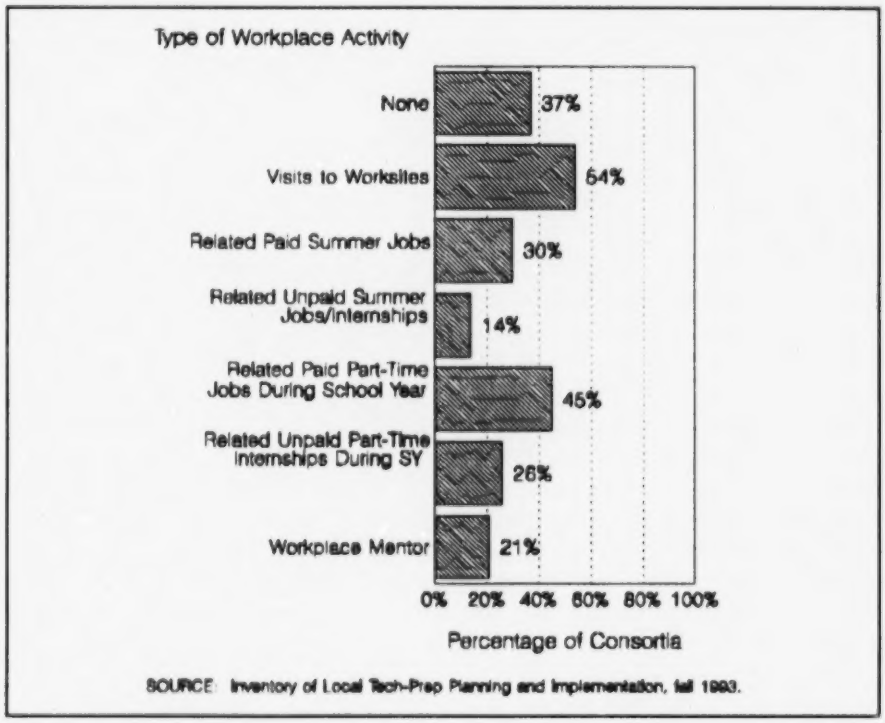
[9]This figure represents the percentage of consortia that reported having job placement performed by any type of staff--course instructors, guidance counselors, or special placement staff. Some consortia reported that job placement is performed by more than one type of staff, so figures in Table VII.4 cannot simply be summed to arrive at this overall figure.

Workplace experiences are relatively widely available in consortium districts

Many consortia report offering workplace activities to Tech-Prep students, and, potentially, other students. Almost two-thirds of the consortia (440 of 702) make some type of workplace opportunity available in at least one member district (Figure VII.5). These opportunities range from occasional activities, such as employer visits or assignment to and interaction with workplace mentors, to more intensive commitments, such as youth apprenticeship. Older grantees were more likely than recent grantees to make workplace experiences available to Tech-Prep students. A somewhat smaller proportion of rural consortia than urban or suburban consortia offer workplace experiences.

FIGURE VII.5

AVAILABILITY OF DIFFERENT TYPES OF WORKPLACE EXPERIENCES TO TECH-PREP STUDENTS



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Most workplace activity is low intensity

Workplace experiences can be divided into low-intensity and high-intensity activities. Low-intensity activities are those in which students participate only occasionally or for a very short-time, and that require less commitment from employers. High-intensity activities are those in which students participate on an ongoing (weekly or daily) basis and for which employers provide substantial resources, including staff time and/or student wages. Most workplace experiences

available to Tech-Prep students are low-intensity activities. For example, more consortia and more secondary districts provide some students with occasional worksite visits than any other type of workplace experience (Figure VII.5). Three hundred and seventy-six consortia (54 percent of all consortia) make employer visits available to Tech-Prep students, and they do so in 1,731 districts, or about 60 percent of their secondary school members. Because worksite visits require the least commitment on the part of employers, it is not surprising that these are the most widely available workplace experiences.

Paid jobs are available in more consortia than are unpaid jobs

Paid employment experiences are currently offered in more consortia than are unpaid jobs or internships (Figure VII.5). For example, paid part-time employment during the school year related to students' occupational program (for example, Youth Apprenticeship) is available in 314 (45 percent) of the consortia. In contrast, only 183 consortia (26 percent) make related unpaid school-year employment or internships available.

The greater incidence of paid positions may reflect several factors. Paid workplace activity is likely to include cooperative education programs, which have been available in many schools for some time. In contrast, formal, structured programs that offer students ongoing unpaid workplace instruction are rare. Employers may have to invest greater resources in providing unpaid training and work experience than paid jobs. Students who are paid wages are likely to be filling actual positions, and to be included in a company's production routine. In these cases, students may receive training only as needed. In contrast, employers may devote more staff time--at substantial cost--to students who are receiving structured training but not wages (Corson and Silverberg 1994).

Even in consortia where workplace positions are offered, they are not necessarily widely available. Consortia that make paid nor unpaid workplace positions available do so in fewer than half of their consortium districts.

Workplace experiences are infrequently a core part of the Tech-Prep program

Requiring all Tech-Prep students to participate in workplace activities and developing the capacity to provide them with worksite placements is more difficult to implement than a general program of assisting interested students in finding positions and allowing Tech-Prep students to participate. Few consortia (164) include some type of workplace experience as part of the core program relative to the number of consortia (440) that make these experiences available to Tech-Prep students in at least one member district.

The overlap between consortia that include workplace experiences as part of the core program and those that make them generally available is significant. However, 45 of the 164 consortia that mandated workplace experiences as part of the core program also reported in fall 1993 that none of their member districts actually made these experiences available. A possible explanation for this finding is that consortium coordinators' reports on the elements of their Tech-Prep core programs may have included expected future elements, rather than components that were actually implemented at the time of the survey.

Secondary school staff have primary responsibility for placing students in workplace experiences

Several types of organizations and staff may match students with workplace opportunities, including secondary school staff, postsecondary school staff, an intermediary organization that works with schools and employers (for example, a chamber of commerce), or employers themselves. Data from the survey indicate that, in most districts, secondary school staff have primary responsibility for workplace placements.

This result is not surprising. Despite the increasing contributions of third-party or intermediary organizations in school-to-work transitions programs (Corson and Silverberg 1994), secondary schools have the most experience in placing students at worksites. Many schools and districts still employ cooperative education counselors or work-experience coordinators, whose primary role is to match interested students with appropriate workplace positions.

VIII. APPROACHES TO STAFF DEVELOPMENT AND PROMOTION OF TECH-PREP

Staff development and promotion are important aspects of Tech-Prep in both the planning stages and later in ongoing operations. An important part of any new initiative is marketing it to a broad constituency, to promote acceptance and involvement among the target community--in this case, teachers, counselors, school administrators, business, industry, labor, and, of course, students. To implement the reforms and produce the institutional changes envisioned by Tech-Prep proponents, consortium staff must become knowledgeable about basic program concepts and must be prepared to undertake new roles and responsibilities. The Tech-Prep Education Act acknowledges the importance of these components and allows or even encourages consortia to use Title IIIE funds for teacher and counselor in-service training.

We asked consortium coordinators to respond to a short set of questions about staff development and marketing during school year (SY) 1992-93. Because these activities are ongoing, we believed it would be too difficult to measure the number of times they occurred or the number of staff who participated in them. However, we did ask coordinators to document the methods of any consortium-wide marketing that had been used, the types of individuals that participated in any staff development activities, and the degree to which specified staff development topics were emphasized.

Most consortia made efforts to market Tech-Prep during the 1992-93 school year

About 85 percent of the consortia had conducted consortium-wide marketing to promote interest in and acceptance of Tech-Prep among the student population, parents, and other community members. Seventy-two percent of the consortia that received their first Title IIIE grant in FY 1993 (136 of 188) were actively promoting Tech-Prep during the 1992-1993 school year, compared with 89 percent of those that received their first grant in FY 1992 (458 of 514). The later grantees may have been less likely to market Tech-Prep because they were still in the early planning stages and not yet recruiting students.

The incentives to promote Tech-Prep and the likelihood that consortia do so may depend in part on how consortia define Tech-Prep. Evidence from the ten in-depth study sites suggests that some consortia view Tech-Prep principally as an effort to articulate vocational courses, and students are considered to be "in Tech-Prep" when they enroll in these courses. In this case, marketing Tech-Prep may not be necessary, because students and most teachers do not differentiate the "Tech-Prep" part of the vocational course. The national survey data partly support this hypothesis. Consortia that defined participation solely on the basis of a student's taking or completing a vocational course were less likely to report some kind of marketing effort than consortia using other definitions.

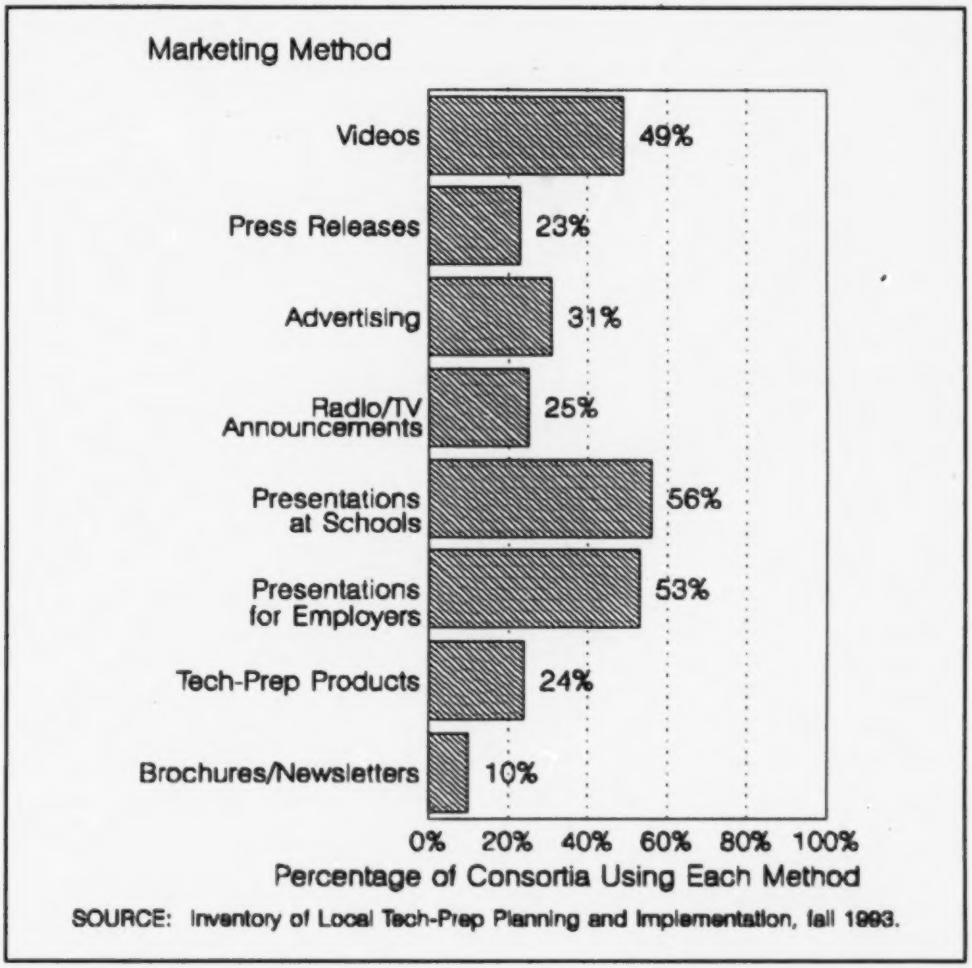
Consortia used a variety of marketing techniques to promote interest in and acceptance of Tech-Prep. More than 80 percent of the consortia that marketed Tech-Prep in SY 1992-93 used press releases, presentations at high schools and community colleges, or presentations to businesses and business groups. About half of the consortia promoted Tech-Prep through Tech-Prep videos; newspaper, television, or radio advertising; or development and distribution of Tech-Prep logos and products. Most consortia used multiple marketing methods.

Presentations were considered the most effective method of Tech-Prep promotion

Consortium coordinators reported that some marketing methods worked better than others (Figure VIII.1). Presentations at secondary and postsecondary schools and to businesses were rated as "very effective" in promoting interest in and acceptance of Tech-Prep by more than half of the consortia that used this method. Another 40 percent rated this method as "somewhat effective". Few reported that these presentations were not at all effective. In contrast, only about one-fourth of those using press releases or radio and television announcements reported these methods as very effective in improving interest in and acceptance of Tech-Prep.

FIGURE VIII.1

MARKETING METHODS RATED AS VERY EFFECTIVE BY TECH-PREP CONSORTIA



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Staff training appears to be a major part of Tech-Prep development

All 702 consortia reported conducting staff development activities related to Tech-Prep for a variety of staff during SY 1992-93. Moreover, staff development was one of the largest categories of spending by Tech-Prep consortia, accounting for an average of almost one-fourth of all expenditures for Tech-Prep (Chapter IV).

Consortia have focused staff development on consortium and secondary school staff. More than 95 percent of the consortia reported including consortium staff, secondary school administrators, secondary academic teachers, secondary vocational teachers, and secondary counselors in some form of Tech-Prep staff development in SY 1992-93.[1]

Postsecondary staff have also participated at high rates in Tech-Prep staff development. Most consortia reported including postsecondary staff in staff development activities, although the proportion is somewhat lower than that for secondary school staff. Postsecondary faculty and postsecondary counselors participated in some form of staff development in 85 and 75 percent of the consortia, respectively.

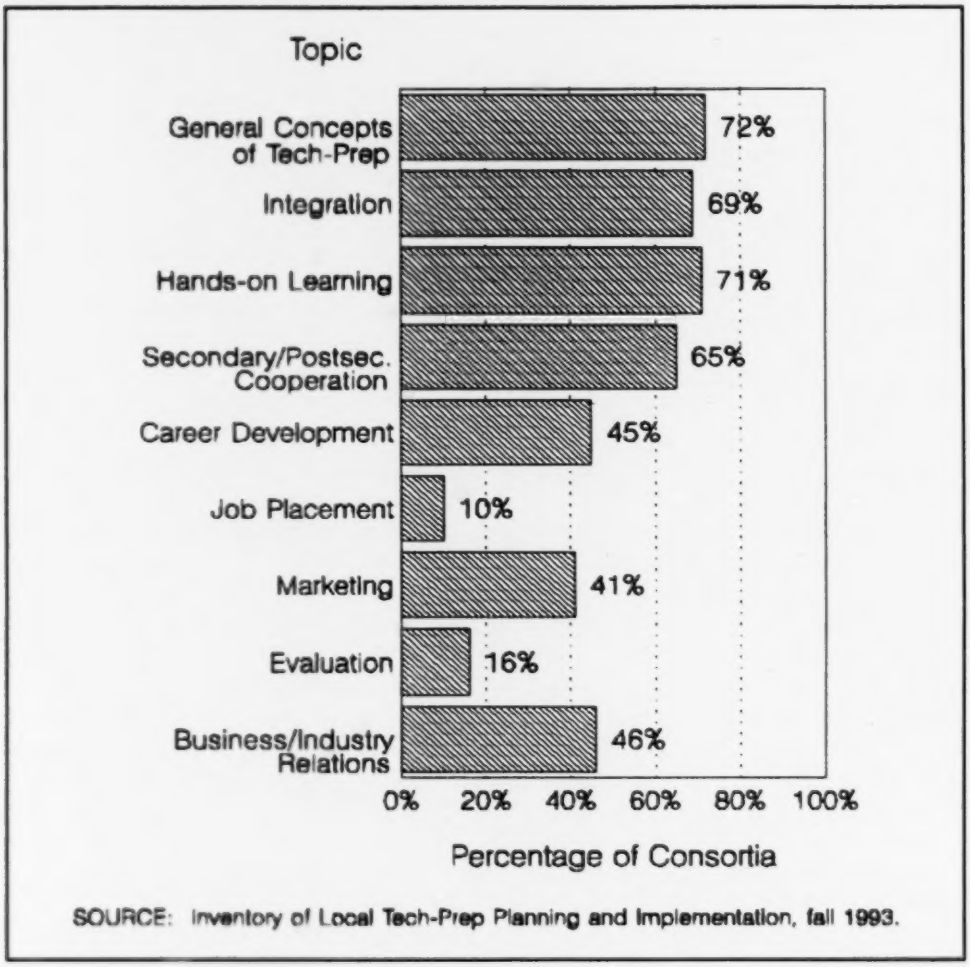
Many consortia were still introducing staff to the basic concepts of Tech-Prep in SY 1992-93

Developing an understanding of the general concepts of and strategies for Tech-Prep was the main focus of staff development activities (Figure VIII.2). When asked to rate staff development topics on the degree to which they were emphasized, almost three-fourths of the consortia reported that general Tech-Prep concepts were "highly emphasized." We expected a higher proportion of newer grantees than older grantees to focus on this topic, with the older grantees focusing on topics more closely related to implementation strategies. However, consortia receiving their first Title IIIE grant in FY 1992 and in FY 1993 were equally likely to emphasize general Tech-Prep concepts in staff development efforts. Larger consortia emphasized this topic more than did smaller consortia.

[1]Respondents may have misunderstood the term "consortium staff" in the context of staff development. More than 97 percent of the consortia reported that consortium staff participated in staff development related to Tech-Prep, but only about 70 percent of the consortia actually had designated staff responsible for consortium-wide activities.

FIGURE VIII.2

MOST HIGHLY EMPHASIZED STAFF DEVELOPMENT TOPICS



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

The fact that many consortia, particularly large ones, are emphasizing basic concepts of Tech-Prep in staff development may be an indication of both the challenges of Tech-Prep implementation and the expansion of Tech-Prep beyond small pilot projects. Research suggests that teacher and counselor resistance to change, "turf" issues, and negative attitudes toward vocational education are significant barriers to Tech-Prep implementation (see Silverberg 1993 and Chapter X). Consortia may consider repeated staff exposure to the basic concepts of Tech-Prep--its objectives, components, and approaches--as a way of overcoming these barriers. Moreover, as discussed earlier, most consortia seem to implement Tech-Prep incrementally, beginning in a small set of districts or schools and expanding to other schools over time. With expansion to new schools within a consortium, additional staff may need a general introduction to Tech-Prep. As a result, we may continue to observe staff development on basic concepts of Tech-Prep in many consortia, even those that began implementation several years ago.

Staff development activities also strongly emphasized new approaches to curricula

Staff development activities focused as much on developing curricula that improve the integration of vocational and academic instruction or promote "hands-on" learning as on general Tech-Prep concepts. Seventy percent of the consortia rated these two important aspects of well-developed Tech-Prep curricula as "highly emphasized" staff development topics (Figure VIII.2). This proportion was similar across consortia, regardless of their age, metropolitan status, or size.

Building relationships is another important staff development theme

Improving relationships between secondary and postsecondary staff, and between schools and business, industry, and labor groups were important topics of staff development for some consortia (Figure VIII.2). Sixty-five percent of the consortia reported a high emphasis on cooperation among secondary and postsecondary faculty in staff development activities. More than 300 consortia, or about 46 percent, reported strongly emphasizing improving relationships with business, industry, and labor.

Job placement and evaluation receive relatively little attention in staff development activities

Few consortia reported emphasizing either student job placement assistance or program evaluation in staff development (Figure VIII.2). Instead, consortia are concentrating on more immediate implementation issues, such as curriculum development, perhaps because these components must be in place when students begin participating in Tech-Prep.

Consortia may view employment as the long-term objective of Tech-Prep--a milestone that will be achieved four years after students enter the program--rather than as part of the program. Only 18 percent of the consortia that described a consortium-wide care program included regular training or employment as a required Tech-Prep activity. Thus, consortia may not yet place a high priority on staff development in this area. During the next several years, two factors are likely to lead to greater emphasis on job placement in staff development. First, more students will approach completion of their Tech-Prep program and will be seeking career-oriented employment. Second, the passage of the School-to-Work Opportunities Act is likely to encourage schools to develop capacity to find work assignments for students at employer sites, during the secondary school years and summers.

Similarly, consortia may not consider evaluation a priority in staff activities and, therefore, in staff development efforts. Rather than viewing evaluation as a continuous source of program improvement information, many consortia likely consider evaluation as an activity to be conducted after the program is fully implemented and stable.

IX. STUDENT OUTCOMES

Local consortia are developing Tech-Prep programs in an effort to improve the workforce preparation of American youth. If these programs succeed, students will develop high-level academic and technical competencies, form aspirations for educational and career attainment, and eventually obtain well-paying, career-oriented jobs. These outcomes are considered critical to the country's ability to compete successfully in a global market.

Interest in Tech-Prep students' achievement of such outcomes is growing. With Tech-Prep programs already completing their third year of federal funding under Title IIIE of the Perkins Act, the U.S. Department of Education is sponsoring several efforts to document Tech-Prep student achievements. Measuring student outcomes is one objective of the national survey of Tech-Prep consortium coordinators.

Aggregate survey data on groups of students can document only certain types of outcomes. A program survey cannot effectively collect information on skills levels, competencies, or grades, because they are measured, computed, and interpreted differently across localities. However, well-defined milestones, such as high school graduation, entry into and completion of postsecondary education and training, and the incidence of employment, are clearly understood terms that can be "counted" relatively easily. These are the primary outcome indicators collected and analyzed as part of the national survey.

Many consortia are still in the early stages of program planning and implementation, and cannot yet report on student outcomes. About 37 percent (260 consortia) have not defined a core program and about 30 percent lack definitions for identifying which students are in Tech-Prep. Fewer than half could report counts of Tech-Prep participants in fiscal year (FY) 1993. Clearly, consortia that could not identify and count participants in the Tech-Prep program would be unable to document the number of students achieving key outcomes. Moreover, because many of the consortia that could report participation had only recently begun to identify students as in Tech-Prep--some starting with a first group of students in the 9th grade, data on the longer-term outcomes of interest in the national survey are not yet available. Fewer consortia reported outcome data than reported participation.[1]

The survey data should be interpreted carefully, because consortia are at different stages of development and are implementing Tech-Prep at different rates. In most consortia, reported outcomes will reflect participation in a program that is evolving. Students who are considered Tech-Prep high school graduates in spring 1993 may have participated in courses and activities that do not yet fully reflect the local program design. The experiences of these students may differ from those of later participants. As consortia refine their definitions of Tech-Prep participation during the next several years, outcome measures may refer to somewhat different concepts--for example, a more

[1]Forty-two consortia reported questionable outcome data that are not included in the analysis presented in this chapter. Most of these respondents reported they were unable to identify and count students in Tech-Prep, but nevertheless reported numbers of Tech-Prep students who had graduated from high school or entered college. In a few cases, the number of Tech-Prep students reported as having graduated from high school in spring 1993 was greater than the total number of 12th-graders in Tech-Prep that year.

cohesive program of study. As a result, the reported number of participants and specific outcomes might actually decline. Alternatively, some consortia could broaden their definitions or expand to include additional districts and schools, resulting in sharp increases in reported participation and outcomes.

Figure IX.1 summarizes the number of consortia reporting and the number of Tech-Prep students achieving each outcome in school year (SY) 1992-1993. The declining numbers as one reads down the chart reflect not only the different stages of consortium development, but also difficulties in tracking and reporting student outcomes. Consortia generally were able to report on participation in more of their member districts than they could on outcomes, such as postsecondary entry. For example, a particular consortium may have Tech-Prep students from five districts that could report high school graduates, but may be able to report the number of college entries for only two districts. Simple computations of outcome rates--such as the percentage of high school graduates who enter college--must therefore be avoided or used very cautiously. Clearly, consortia have a long way to go in reporting both participation and outcomes, and state and federal help in developing the capacity to track these important measures may be useful.

The remainder of this chapter presents more detailed analysis of outcomes for Tech-Prep students. The three sections describe, in order, graduation from high school; entry into and completion of postsecondary education and training; and employment, both directly after high school and after attainment of a postsecondary degree or certificate.

HIGH SCHOOL GRADUATION

Graduating from high school can be an intermediate or "exit" outcome. For most Tech-Prep participants, high school graduation represents a mid-way point in their program of study. For others, it may mark the end of their education--at least temporarily--either because of financial constraints or career goals that do not require postsecondary education.

Counts of Tech-Prep high school graduates can be affected by several factors. Many consortia have not defined what it means to participate in Tech-Prep and thus cannot identify participants and their outcomes, either because they are still in an early stage of development or because they have chosen not to implement Tech-Prep as a distinct program with identified participants. Some consortia could identify Tech-Prep students but none were yet in the 12th grade during the school year for which we were collecting data--SY 1992-1993. Some consortia could not report Tech-Prep participation because they lacked the resources to assemble data from all the relevant sources.

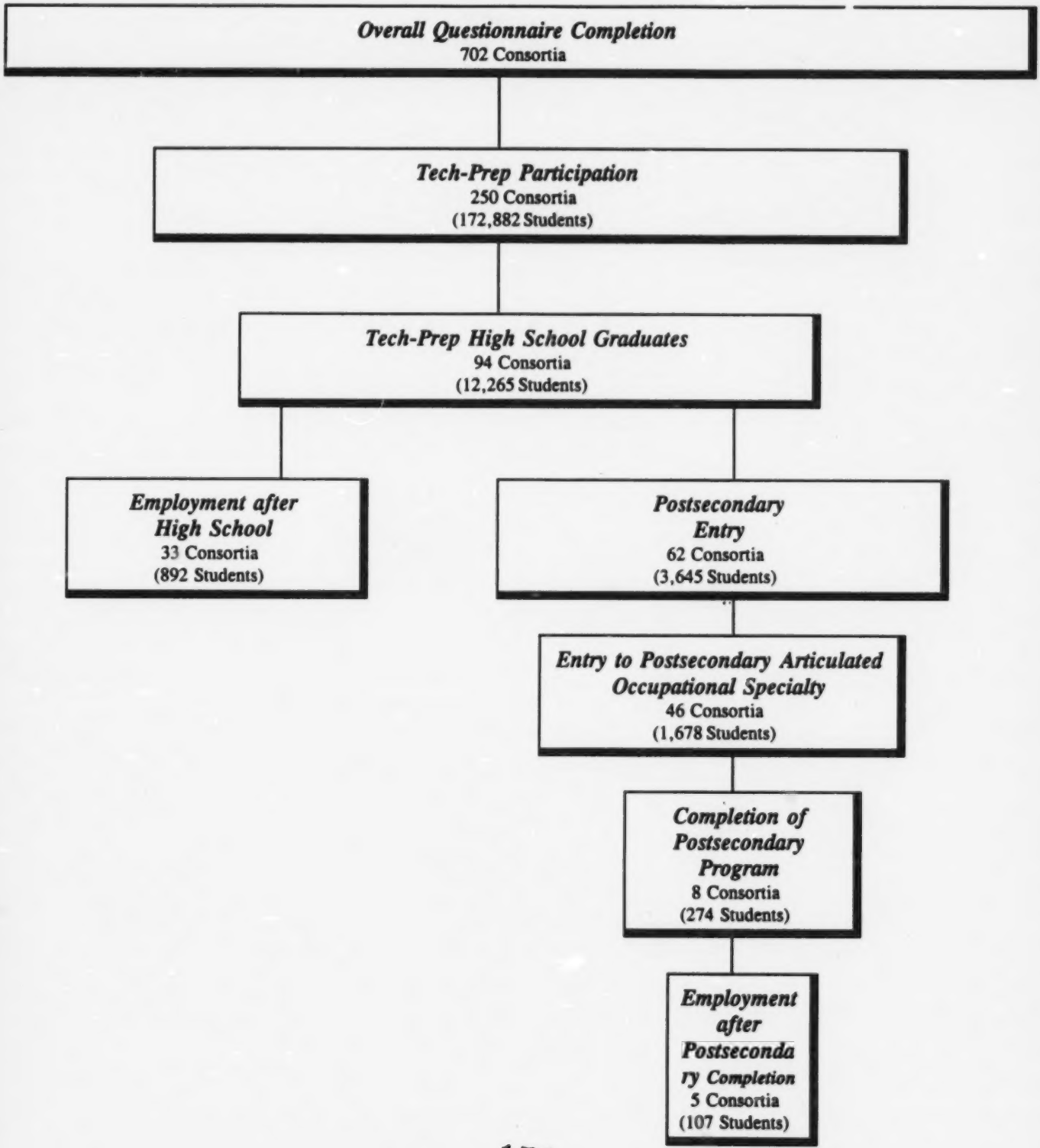
The ability to count Tech-Prep high school graduates is relatively recent

Most consortia that have graduated Tech-Prep students from high school have begun to do so only recently. A total of 114 consortia (16 percent of all consortia) reported that at least one of their member districts graduated Tech-Prep students from high school in spring 1993. Of these 114 consortia, 94 could actually report the number of Tech-Prep high school graduates. Districts in 66 of the 94 consortia (70 percent) had graduated students defined as in Tech-Prep for the first time in spring 1993.

Some consortia have been developing Tech-Prep for some time and reported that Tech-Prep students began graduating from high school before the consortia had received their first Title

FIGURE IX.1

SUMMARY OF SURVEY RESPONSES FOR KEY OUTCOMES IN 1993



IIIE grant. Fourteen of the 94 consortia with Tech-Prep high school graduates reported beginning to graduate students before receiving their first grant. These consortia probably had some kind of program or component of Tech-Prep in place before Title IIIE funds were awarded. This finding confirms research indicating that districts awarded Title IIIE grants in the early years of the federal program were more likely to have begun already to implement Tech-Prep (see Chapter VII; NAVE 1994). Because most grants to consortia were awarded on a competitive basis, it is not surprising that consortia receiving early grants would have been most advanced.

Reporting of outcomes reflects the fact that implementation is occurring in stages in most consortia. Among the consortia that reported having graduated Tech-Prep students in spring 1993, graduating students came from only about half of member districts.

Tech-Prep high school graduates have had diverse program experiences

Consortia with Tech-Prep high school graduates have different definitions for participation and for their core programs. Twenty-three of the 94 consortia that reported the number of graduates (about 25 percent) did not have a consortium-wide definition of participation. Of the other 71 consortia, 39 include completion of vocational and applied academic course work in their definition; 17 of these use a definition of participation that is similar to the Hull and Parnell model, in which a student chooses to be in Tech-Prep, develops a four- or six-year educational plan, and takes both applied academic and vocational courses.

Consortia have reported more than 12,000 Tech-Prep high school graduates

A relatively large number of Tech-Prep students graduated from high school in the small number of consortia reporting data on spring 1993 graduates. The 94 consortia reported a total of 12,265 Tech-Prep seniors graduating from high school in spring 1993, an average of 130 Tech-Prep students per consortium that reported graduates.

The number of Tech-Prep high school graduates varied widely across states. Consortia in 11 states had more than 500 reported Tech-Prep graduates, whereas those in 19 states reported no Tech-Prep graduates in spring 1993. Small numbers of graduates were reported in other states, usually by a single consortium in that state.

A majority of 12th-grade students who are defined as in Tech-Prep graduate from high school. The 12,265 spring 1993 graduates represent 64 percent of the Tech-Prep high school seniors reported in the 94 consortia for school year 1992-1993. This computed percentage is a lower-bound estimate, however. Consortium coordinators could report counts of Tech-Prep high school graduates for only 364 of the 417 districts for which they could report counts of Tech-Prep participants. The 64 percent is an accurate estimate of the proportion of Tech-Prep seniors that graduate from high school only if we assume that the 53 non-reporting districts did not have any Tech-Prep graduates. However, it is likely that many of these non-reporting districts with Tech-Prep participants graduated Tech-Prep seniors since, nationally, more than 90 percent of

all seniors graduate.[2] Consortium coordinators may simply have been unable to collect data on graduates for those 53 districts.

A better estimate of the proportion of Tech-Prep seniors that graduated from high school would include some measure of the number of graduates in districts that could not report them, but could report the number of seniors. One adjusted estimate is 74 percent.[3] This estimate assumes that the 53 non-reporting districts had the same number of graduates, on average, as the 364 reporting districts. However, if reporting districts had fewer graduates than non-reporting districts, the adjusted measure is too low. It seems likely that smaller districts would be better able to track and report on Tech-Prep students' progress; thus, the computed 74 percent may still not be an upper bound estimate of the proportion of Tech-Prep seniors that graduated from high school. Data from the national survey do not allow us to compute a more precise measure.

The estimated rate at which Tech-Prep seniors graduated from high school varies with metropolitan status. A much lower proportion of 12th-grade Tech-Prep students in urban consortia than in suburban or rural consortia were reported to have graduated. This difference may arise because Tech-Prep participants in urban consortia are more likely to be economically or educationally disadvantaged.

POSTSECONDARY EDUCATION AND TRAINING

A key component of the Tech-Prep model is specialized technical education or training at the postsecondary level culminating in an associate degree or certificate from a two-year program. Ideally, students begin planning for postsecondary education during high school, and their secondary school program is coordinated with curricula at the college level.

The national survey contained three questions about transitions of Tech-Prep students to postsecondary education. First, the survey asked consortium coordinators to report the number of districts that maintained records on the number of Tech-Prep students who entered postsecondary programs in member institutions. Second, coordinators were asked to report the number of students identified as Tech-Prep high school graduates who had entered different types of postsecondary institutions or activities in fall 1993. Third, they were asked to report the number of students entering and completing articulated occupational specialties.

Tracking postsecondary education is a substantial challenge in some consortia

Some consortia have reached the stage in which Tech-Prep students have reportedly entered postsecondary education or training. Seventy-nine of the 94 consortia that could report Tech-Prep high school graduates reported that some of these graduates had entered postsecondary institutions. Only 4 of the 94 said that none of their Tech-Prep graduates were pursuing postsecondary education.

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[2]This figure was computed using ED-INFO data on the number of 12th-grade students and the number of regular diploma graduates.

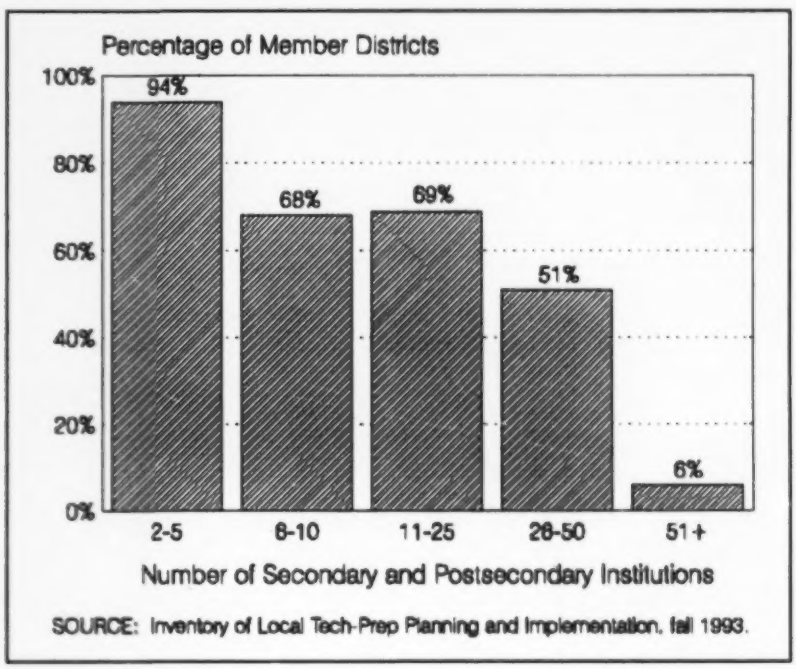
[3]This figure was computed by dividing the computed proportion--64 percent--by the proportion of districts that could report on graduation (364 of 417, or 87 percent).

However, it is often difficult for consortium coordinators to determine whether and how many Tech-Prep students have entered or completed postsecondary education or training. The remaining 11 coordinators from the 94 consortia with Tech-Prep high school graduates did not know whether any high school graduates were entering college or other postsecondary activities. Even some consortia where Tech-Prep students are reportedly entering postsecondary transitions do not maintain records that would enable coordinators to report the number of such students. Seventeen of the 79 consortia that reported having postsecondary transitions either did not know how many districts track postsecondary entry or knew that none of the districts had this capability and therefore were unable to report actual numbers of students. Sixty-two of the 79 consortia did have the capability of reporting on postsecondary entry.

Consortium size may affect the feasibility of reporting postsecondary enrollment. Small consortia may have closer relationships among members, which facilitate the tracking and collection of data on students. Small consortia also generally have fewer Tech-Prep students whose progress they must track. Among the consortia that had Tech-Prep high school graduates, smaller consortia could report on postsecondary entry in a higher proportion of member districts than could larger consortia (Figure IX.2). This finding may also reflect the fact that larger consortia are more likely to be concentrating implementation in a few districts, and to have member districts in varying stages of development; a smaller proportion of districts in these large consortia would thus be able to report Tech-Prep participation and outcomes such as postsecondary entry.

FIGURE IX.2

PERCENTAGE OF MEMBER DISTRICTS REPORTING POSTSECONDARY ENTRY, BY CONSORTIUM SIZE



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Postsecondary education or training is a pathway for many Tech-Prep high school graduates

Tech-Prep students who graduate from high school are expected to pursue postsecondary education or training. The 62 consortia that could track postsecondary entry of 1993 graduates reported a total of 3,551 Tech-Prep students entering postsecondary education institutions or programs (Figure IX.3). This figure represents slightly less than half of the Tech-Prep students who graduated from high school in those consortia in spring 1993.

It is important to interpret these data with some caution. The computed rate of postsecondary entry is based on relatively few consortia--slightly less than 10 percent of all 702 survey respondents. However, the 62 consortia were able to track postsecondary entry of Tech-Prep students in virtually all of the districts in which they could track students' graduation from high school. Therefore, the report on postsecondary entry should not be biased by lack of information.

Community colleges are the primary destination of Tech-Prep students who pursue postsecondary education or training

Although Tech-Prep students are engaged in a variety of postsecondary activities, the majority of those who pursue postsecondary education or training enroll in a community, junior, or technical college (Figure IX.3). Of the 3,551 postsecondary entries reported in fall 1993, 2,422 (68 percent) were to two-year institutions.[4] In contrast, the numbers of students entering proprietary schools, registered apprenticeship programs, or the armed forces were considerably smaller. More than 700 Tech-Prep students reportedly enrolled in four-year colleges. This distribution may reflect the way in which consortia targeted students (for example, enrolling students with declared plans to enter a community college), the influence of articulation agreements on where students pursue postsecondary education, or the greater availability of community college programs relative to proprietary schools and registered apprenticeship programs.

Most Tech-Prep students who attend community colleges are in articulated occupational programs

Tech-Prep college students enroll in articulated occupational programs more often than in general academic transfer programs. More than 50 of the 61 consortia with students attending community colleges reported that students had entered articulated postsecondary specialties in fall 1993. Forty-six consortia were able to report the number of Tech-Prep students in these programs. The reported 1,678 students represent 70 percent of Tech-Prep students attending community colleges in fall 1993 in those 46 consortia.

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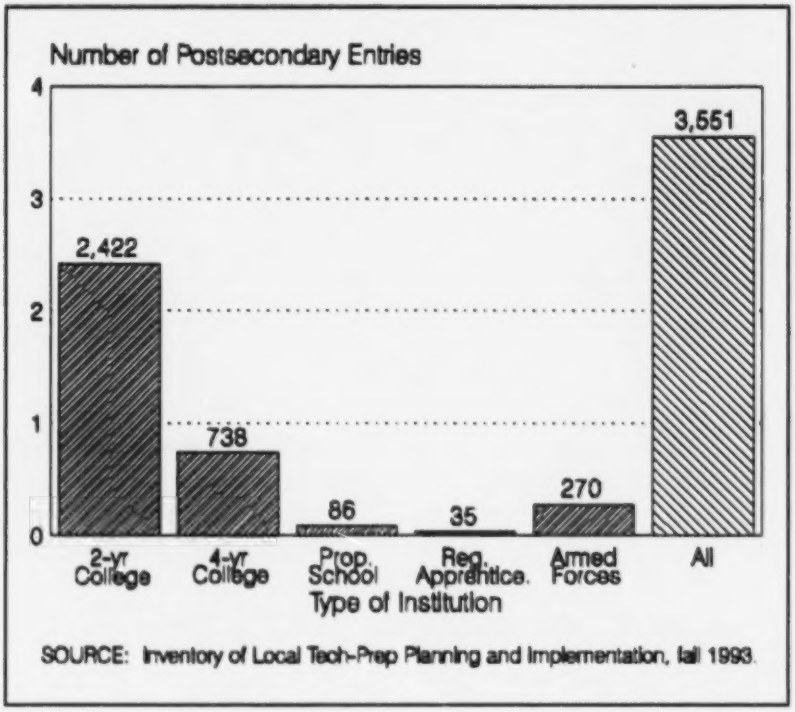
[4]Sixty-one of the 62 consortia that could report on postsecondary entry said that at least some students matriculated to community, technical, or junior colleges.

FIGURE IX.3

NUMBER OF TECH-PREP HIGH SCHOOL GRADUATES ENTERING POSTSECONDARY EDUCATION OR TRAINING, BY TYPE OF INSTITUTION



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

In a few consortia, students have already completed postsecondary degrees or certificates

Given that Tech-Prep initiatives are relatively new, we expected that only a few consortia would have had students completing the postsecondary component of the Tech-Prep program in spring 1993. Consortia with students at such an advanced stage in the program would have to have graduated these Tech-Prep students from high school in spring 1992 or earlier, and to have implemented the secondary school components of the program before SY 1989-1990.[5] We did not anticipate that many consortia would have conceived of and begun planning for Tech-Prep several years before Title IIIE funding was available.

Seventeen consortia reported that Tech-Prep students completed articulated postsecondary programs in spring 1993. However, only eight of the 17 had begun graduating Tech-Prep

[5]Because data on postsecondary program completion were based on completion in spring 1993, students reportedly completing a two-year program would have had to have graduated from high school in spring 1991 or earlier. In analyzing reports of postsecondary program completion, we also included consortia that first graduated Tech-Prep seniors in 1992, since some students may have pursued a one-year postsecondary certificate or degree program.

students by spring 1992. A total of 203 students from these eight consortia received postsecondary degrees or certificates from articulated occupational programs.[6]

EMPLOYMENT

Helping students to obtain career-oriented, self-sustaining jobs is the ultimate objective of Tech-Prep. However, paths to employment are varied. Some students enter the workforce only after completing an associate degree, whereas some work and pursue postsecondary education concurrently. Others complete their education after high school and enter employment directly after graduation.

The national survey collected information on several aspects of employment reporting, focusing specifically on jobs in occupational fields related to students' Tech-Prep program of study. First, we asked in the survey whether consortium coordinators were able to report on post-high school employment--that is, the number of districts in which information was available about the 1993 Tech-Prep high school graduates who were currently employed. Second, we asked how many of the 1993 graduates were known to be employed, with employment defined as either full-time or part-time.[7] Third, we asked about methods of obtaining employment information. Fourth, we asked coordinators how many Tech-Prep students who had completed articulated postsecondary degree or certificate programs in spring 1993 were known to be employed.

Capacity to track employment of Tech-Prep students is, so far, limited

Many consortia lack information about the number of Tech-Prep high school graduates who are employed. Only half of the 94 consortia that reported spring 1993 graduates were able to obtain information on jobs that students take. Furthermore, the 47 consortia that claimed to be able to track this information could do so in only 60 percent of their member districts overall, and in about 87 percent of the districts in which they could report Tech-Prep high school graduates. Only 33 of the 47 consortia actually reported the number of high school graduates who were employed.[8]

Consortia generally obtain information about student jobs in an ad hoc manner. Of the 33 consortia that reported data on student employment, 70 percent reported having obtained it through ongoing contact with individual students. Fewer than half of the 33 consortia reported conducting some type of survey after students' graduation, and about one-third reported surveying students about their plans just before graduation. These surveys may have been

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[6]The other nine consortia had first graduated Tech-Prep students from high school in spring 1993. It is impossible to conceive of a way for these students to have completed even a one-year postsecondary program at the same time as their graduation from high school, even in a well-articulated, time-shortened program. It is possible that the reported program completions represented those of adults who entered postsecondary Tech-Prep components through what is often termed a "bridge" program. However, Title IIIE considers a Tech-Prep program to be a four-year program beginning in high school. Therefore, we did not count the potential bridge program completers in our estimates of Tech-Prep postsecondary completion.

[7]Employment could be combined with postsecondary studies.

[8]Another three consortia reported that no Tech-Prep high school graduates were employed.

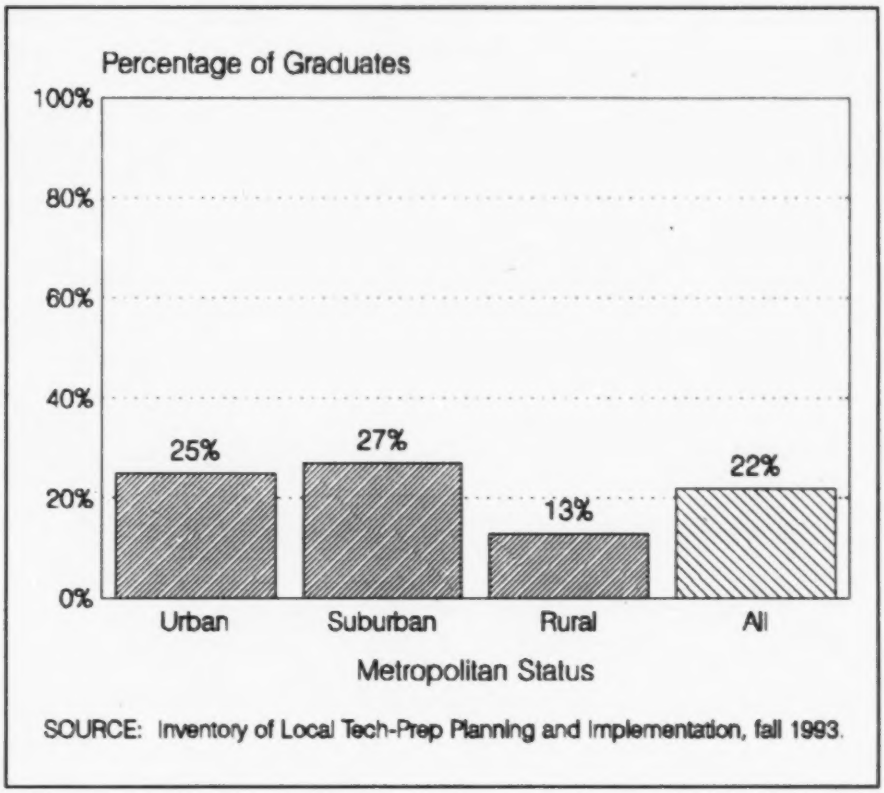
conducted specifically to collect information about Tech-Prep participants, or more generally, to obtain information about broader groups of graduating students.

Students in rural consortia are least likely to take related jobs after high school

Thirty three of the 94 consortia with graduates in spring 1993 reported that some students obtained full-time or part-time employment after high school. They reported a total of 892 students in these jobs, or about 22 percent of the reported Tech-Prep high school graduates in the 33 consortia (Figure IX.4). A lower proportion of Tech-Prep high school graduates in rural consortia were reported as employed relative to graduates in urban or suburban consortia. Fewer than 13 percent of high school graduates in rural consortia were employed, compared with about 25 percent in consortia in the other geographic areas.

FIGURE IX.4

PERCENTAGE OF TECH-PREP HIGH SCHOOL GRADUATES IN JOBS AFTER HIGH SCHOOL, BY METROPOLITAN STATUS



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Employment after completion of postsecondary programs is not widely reported

Few consortia can report on employment after completion of a postsecondary program. Only a small number of consortia have been implementing Tech-Prep long enough for identifiable participants to have completed a secondary and postsecondary sequence. In addition, consortium staff are likely to have even greater difficulty collecting data on and tracking employment after students' completion of postsecondary education than collecting and tracking employment data after high school graduation.

Eight consortia had Tech-Prep students who completed articulated postsecondary programs in spring 1993. Five of the eight were able to report on the number of students employed after postsecondary degree attainment. The five consortia reported a total of 121 Tech-Prep program graduates in program-related employment.

X. LOCAL EVALUATION OF TECH-PREP IMPLEMENTATION

Although the Tech-Prep Education Act does not require Title IIIE grantees to conduct program evaluations, most states require consortia to document their planning and implementation efforts. Fifty-one states have established procedures for Tech-Prep consortia to report on their progress, and 28 require consortia to report on student participation and outcomes. Whether based on a formal, prescribed evaluation process with standard measures, or more ad hoc narratives of implementation progress, these local evaluations are important inputs into state and federal performance reporting on Tech-Prep.

In this chapter, we describe local collection of evaluation data and local coordinators' general observations about the progress of Tech-Prep implementation. We begin by discussing the status of evaluation plans, the development of databases, and approaches to collecting and analyzing data. We then present consortium coordinators' perceptions of obstacles to and successful aspects of Tech-Prep implementation.

TECH-PREP DATA COLLECTION AND ANALYSIS

Evaluation data have several potential uses. Consortium leaders can use the information for purposes of program improvement--for example, to identify potential implementation problems and formulate corrective steps. Consortium coordinators also rely on the data to respond to requests for information and status reports from funders, including school boards, businesses and industry, and state and federal agencies.

Evaluation capabilities at the local level will determine the feasibility of implementing federal performance measures. Establishing consistent performance measures will require that consortia be able to identify which students are in Tech-Prep, and track and report on the students' progress. To date, slightly more than one-third of the consortia are able to identify Tech-Prep participants, and there is some indication that, as other consortia develop further, they, too will be able to identify participants. However, the extent to which these and other consortia can collect data on student participation and outcomes will ultimately influence how likely performance measures are to be adopted and routinely reported.

The national survey included questions on consortium plans to conduct evaluations and to collect data. We asked about the existence and status of computer systems to record information on individual Tech-Prep students, and about the specific types of data contained in the systems. We also asked about methods of data collection and analysis that had been used in the year preceding the survey.

Most consortia at least have a plan for evaluating Tech-Prep

Local plans for evaluating Tech-Prep are fairly widespread, but the extent to which evaluation activities have actually been conducted is unclear. Sixty-nine percent of the consortia reported plans for evaluating the implementation and outcomes of Tech-Prep.

The proportion of states' consortia that reported evaluation plans varied substantially. In nine states, between 80 and 100 percent of the consortia reported having such plans. In ten states, half or fewer than half of the consortia reported evaluation plans. One might expect that these differences partly reflect the priorities that states place on submission of evaluation results by local consortia. However, among both states with high rates of evaluation plans and those with low rates of evaluation plans, a similar proportion of states required that consortia include results of local program evaluation in their progress reports to state agencies.

The likelihood that a consortium is planning for evaluation does not appear to be sensitive to the extent of implementation. Older and newer consortia (as measured by the year in which they first received a Title IIIE grant) were equally likely to have plans. Among consortia that were able to identify and report on Tech-Prep participants, the number of years they had been enrolling students had no affect on the proportion with evaluation plans.

Most consortia are planning to develop or are implementing a Tech-Prep student database

Intentions to create computer systems with Tech-Prep data are relatively high.[1] More than three-fourths of all consortia report that they expect to develop or have already developed a computerized database containing information on individual Tech-Prep students. If these expectations are fulfilled, state and federal collection of data on Tech-Prep will be more easily achieved. However, unless consortia accompany their efforts to develop databases with efforts to develop programs and definitions enabling them to identify students who are considered in Tech-Prep, computer systems alone will be ineffective.

Although most consortia are planning to develop Tech-Prep student databases, relatively few actually had done so by fall 1993 (Figure X.1). Older grantees were more likely to have either partially or fully implemented computer files with Tech-Prep data than were more recent grantees (19 percent versus 7 percent, respectively).[2] In both groups of grantees, however, significantly more consortia were still in the planning stage (58 percent overall). Sixty-three percent of the consortia that had at least partially implemented a database also had begun to identify and report on Tech-Prep participation.

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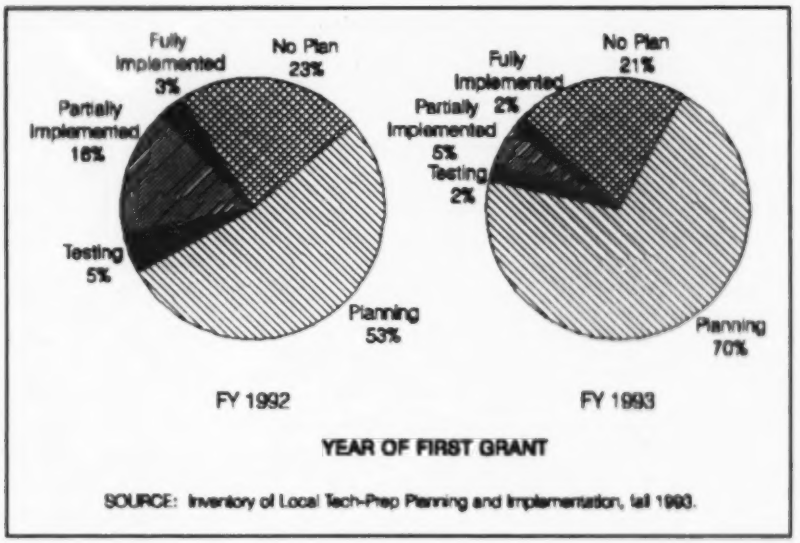
[1]The survey question clearly specified that the computerized database did not have to be a system containing data on Tech-Prep students only; it could be an extension or addition to an existing student database.

[2]"Partially" implemented was defined as having a system from which data were available for some Tech-Prep students or some consortium members.

FIGURE X.1

PERCENTAGE OF CONSORTIA WITH TECH-PREP STUDENT DATABASES IN DIFFERENT STAGES, BY YEAR OF FIRST TITLE IIIE GRANT



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Most database designs focus primarily on documenting transcript information

Consortia that are testing or implementing student databases track standard transcript data more often than any other type of student data. Academic and vocational courses taken or completed, and grades attained were the most common items reportedly included in databases (Table X.1). Program enrollment by course cluster or occupational specialty was cited as an element of the databases almost as frequently; these data may also be based on transcript information since clusters are often defined according to courses taken. Fewer than half of the consortia include or plan to include specific competencies in their databases.

Work-related information is not currently standard in Tech-Prep databases. About one-third of the consortia that are testing or implementing databases record information about Tech-Prep workplace experiences, job placements, or wages.

Program data collection has focused mostly on informal discussion with staff

Most consortia are engaged in some type of information gathering about program implementation, regardless of the status of their evaluation plans or student databases. Only six consortia (1 percent) reported that they did not collect any program information during the 1992-93 school year.

To support their evaluation efforts, most of these consortia have relied on information collected through informal discussions with staff, rather than collecting data on students. Seventy-two percent of the consortia reported holding small group discussions with consortium staff or governing board members, or with teachers and counselors. In contrast, about one-third held

TABLE X.1

ELEMENTS INCLUDED IN TECH-PREP STUDENT DATABASES
(Percentage of Consortia)

Data Element	Percentage of Consortia Collecting or Planning to Include Data	
	For Secondary Students	For Postsecondary Students
Academic Courses Taken/Completed	80	52
Vocational/Occupational Courses Taken/Completed	84	52
Technical Skills/Competencies Attained	46	28
Grades	77	50
Career Counseling Services Received/Used	33	21
Level of Remediation Required	31	37
Program Enrollment by Career Cluster or Occupational Specialty	74	46
Diploma/Degree/Certificate Attainment	54	46
Workplace Experiences as a Part of Tech-Prep	31	19
Job Placement Data (e.g., Placement in Occupations Related to the Course of Study)	26	28
Wage/Salary Data	11	16
Employer Satisfaction Information	15	14

SOURCE: Inventory of Local Tech-Prep Planning and Implementation, Fall 1993.

*Table entries are percentages of those consortia that reported currently testing or implementing a database to monitor outcomes of Tech-Prep students. Overall, these consortia represent 20 percent of all consortia responding to the survey.

small group discussions with Tech-Prep students, and about one-fourth conduct surveys or abstract records to gather aggregate data on outcomes of Tech-Prep students in consortium districts.

Furthermore, some consortia that claimed to be testing or implementing databases containing student-level information did not report actually collecting student data. Less than 50 percent of consortia near implementation of a database reported collecting data on individual Tech-Prep students.

COORDINATORS' OBSERVATIONS ON THE PROGRESS OF TECH-PREP

Consortium coordinators' perceptions of progress in Tech-Prep implementation serve as a context to the discussions in previous chapters of interpretations of Tech-Prep development. Their perceptions of the major barriers to implementation and the successful features of Tech-Prep may help to identify issues that can be addressed by state or federal policy. In the national survey, coordinators were asked to cite the factors that had presented the greatest obstacles to or problems in the planning and implementation of Tech-Prep within their consortia. They also were asked to report on the aspects of Tech-Prep that had been most successful in their consortium.

The most common obstacles are insufficient resources and negative attitudes toward vocational education

The most pervasive problems facing Tech-Prep programs are funding and attitudes. Negative attitudes toward vocational education and/or Tech-Prep and a lack of staff, time, and money for Tech-Prep at the secondary level were most frequently cited as serious problems--by more than two-thirds of consortium coordinators (Figure X.2).[3] Older and newer grantees were equally likely to report resources as a barrier. Older grantees were slightly more likely to cite negative attitudes as an obstacle to implementation.

Implementation of Tech-Prep at the secondary level is frequently undermined by the lack of an integrated curriculum, a priority for Tech-Prep course scheduling, or a clear definition of Tech-Prep participation

Consortia continue to have difficulty integrating vocational and academic education to create programs of study for Tech-Prep students. Almost 60 percent of the consortia reported in fall 1993 that the lack of a truly integrated curriculum is a major obstacle to Tech-Prep implementation (Figure X.2). Undoubtedly contributing to this difficulty are such factors as insufficient collaboration between vocational and academic educators and difficulties in defining and revising curricula (cited as a barrier by 37 percent and 44 percent of coordinators, respectively).

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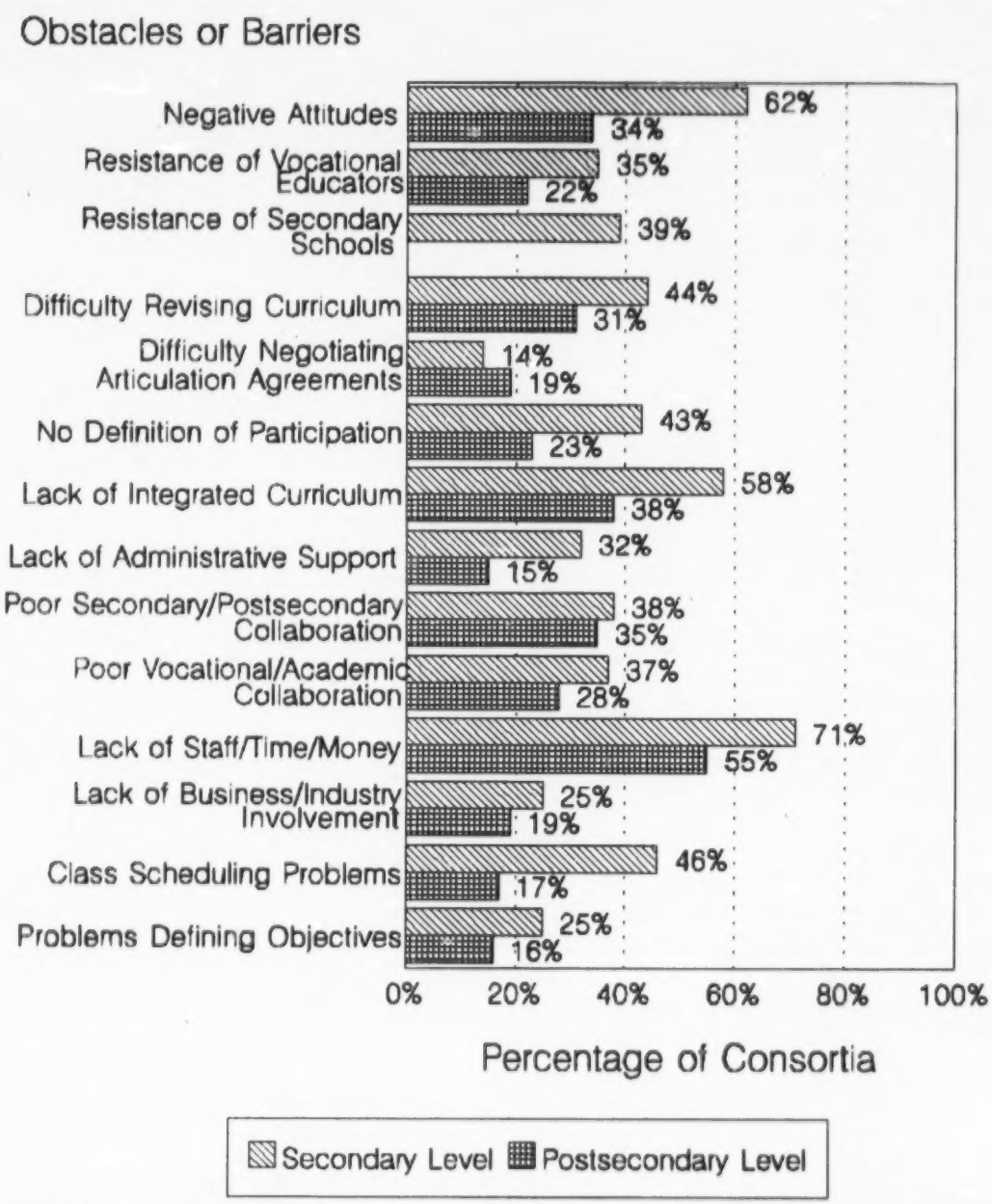
[3]Based on information from visits to in-depth study sites, it appears that "negative attitudes" about vocational education are encountered among parents, students, and academic teachers and counselors--although certainly to a degree that varies from one locale to another.

FIGURE X.2

REPORTED OBSTACLES OR PROBLEMS IN PLANNING AND IMPLEMENTING TECH-PREP
(Percentage of Consortia)



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Class scheduling conflicts also affect student participation in programs of study. To implement a sequence of related, integrated academic and vocational courses, class schedules must be configured so that students can actually enroll in the relevant courses. However, almost half of consortium coordinators cited class scheduling constraints or conflicts as a significant barrier to Tech-Prep implementation (Figure X.2). The lack of priority given to resolving scheduling issues was also observed to be an implementation problem in some of the in-depth study sites. Some of these scheduling difficulties probably reflect the newness of the program and a lack of full support for Tech-Prep by school administrators. Cost might also be a factor. Administrators who might be willing to offer a vocational course to a limited number of enrollees might be reluctant to set aside or schedule special academic courses for these few students, because such a "program" may not be cost effective.

Arranging course schedules is a major factor in implementing a definition for Tech-Prep participation. Definitions of which students are to be considered "in Tech-Prep" are often based on enrollment in certain classes. Therefore, if the courses are not offered in a schedule that enables students to participate in them, the definition is difficult to apply.

Defining Tech-Prep participation continues to challenge many consortia. More than 40 percent of the coordinators (from 299 consortia) reported that the lack of a definition for participation was one of the greatest obstacles to implementing Tech-Prep in their consortia. Thirty-one of these consortia reportedly already had established and were using a definition to report the number of Tech-Prep students but were apparently dissatisfied with their current definitions. Older grantees were even more likely than newer ones to report the lack of definition as a barrier, probably because these consortia are closer to serving students or are already doing so. Consequently, their need to determine which students should be considered "in Tech-Prep" is more immediate.

The greatest barriers to Tech-Prep are at the secondary level

Although efforts of both the secondary consortium members and postsecondary consortium members are important in Tech-Prep implementation, more consortia face obstacles at the secondary level than at the postsecondary level (Figure X.2). This imbalance probably reflects the greater need for change and the current concentration of Tech-Prep activity in high schools rather than in community colleges. As discussed in Chapter VII, most new Tech-Prep curricula are being implemented at the secondary level. Postsecondary faculty may have participated heavily in the development of these curricula, but secondary teachers are likely to bear the brunt of the implementation efforts. Moreover, because Tech-Prep students have advanced to the postsecondary level in only a few consortia, few postsecondary faculty have already faced the need to institute curriculum changes.

Consortia are relatively satisfied with the level of business and industry involvement in Tech-Prep

Most consortia receive some support from business, industry, and labor groups and are generally happy with it. Relatively few consortia reported a lack of business and industry involvement in Tech-Prep as an obstacle to implementation (Figure X.2). In fact, coordinators of nearly half the consortia reported that obtaining this involvement was one of the successes of Tech-Prep implementation (Figure X.3). Of the 177 consortia that cited insufficient business and industry involvement as a major barrier, 53 (30 percent) lacked any support from these groups. The

remaining 70 percent of the 177 consortia appear to be dissatisfied with the current level or type of support.

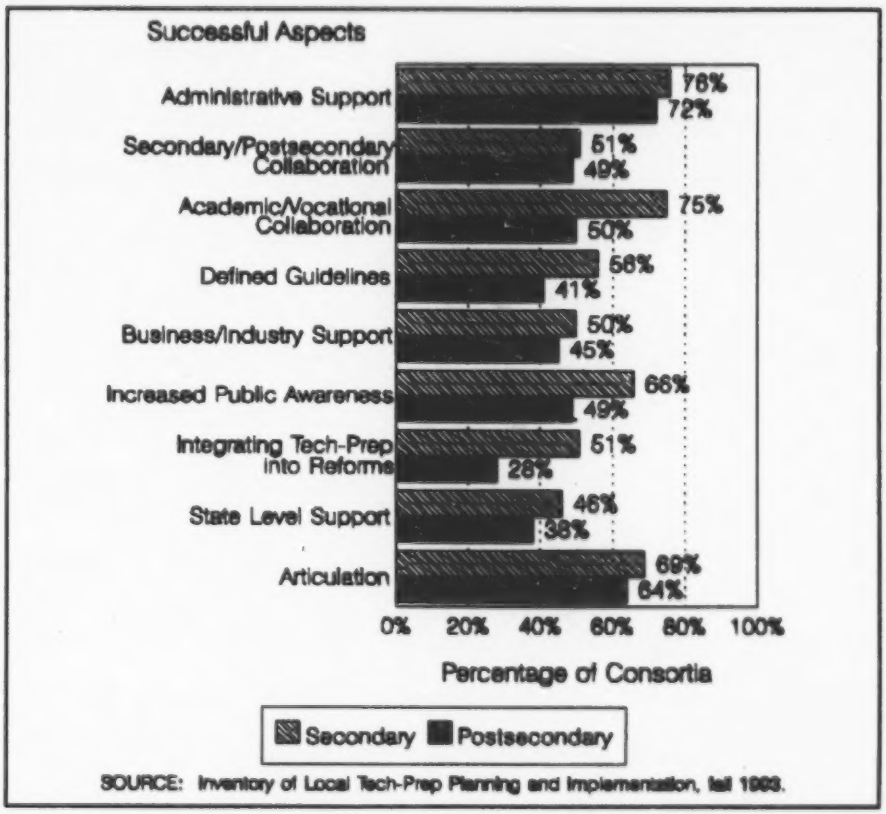
The Tech-Prep Education Act did not specify roles for business, industry, and labor, and, to date, these groups generally have contributed fairly low-level support (see Chapter III). During the next several years, increasing numbers of consortia may attempt to make workplace experiences a more routine part of Tech-Prep. If they succeed in doing so, demands on the private sector could increase, and satisfaction with its involvement may change.

Articulation is considered a successful component of Tech-Prep implementation

Development of articulation agreements is a major activity of Tech-Prep consortia, and one that most coordinators view with satisfaction. Almost three-fourths of the consortia had signed new articulation agreements within the two years preceding the survey. Very few reported difficulties in negotiating these agreements as a serious problem (Figure X.2). In fact, almost 70 percent of the consortia cited development of articulation agreements as one of the most successful aspects of Tech-Prep implementation (Figure X.3).

FIGURE X.3

ASPECTS OF TECH-PREP CONSIDERED MOST SUCCESSFUL AT THE SECONDARY AND POSTSECONDARY LEVELS



SOURCE: Inventory of Local Tech-Prep Planning and Implementation, fall 1993.

Perhaps one reason articulation has proved to be less daunting than other components of the Tech-Prep model is that many consortia are building on previous experiences in this area. Secondary and postsecondary institutions in nearly 60 percent of the consortia had signed articulation agreements before the Tech-Prep consortium was established. Consortia without a track record of articulation were more likely to consider developing these agreements to be a barrier to implementation.

Building collaboration and support among educational partners is viewed as a major accomplishment

Virtually all of the reforms promoted by Tech-Prep--including curriculum integration, articulation, and programs of study--require consortium members to work together effectively. Despite some implementation problems, coordinators generally considered this collaboration to be an important accomplishment of their Tech-Prep initiatives. More than three-fourths of consortia coordinators consider administrative support for Tech-Prep to be a successful feature of their Tech-Prep planning and implementation efforts (Figure X.3). More than three-fourths also reported collaboration between secondary and postsecondary educators as a successful feature.

Consortium coordinators perceive progress in building close working relationships among partners, but many still see a need for substantial improvement. Although many consortium coordinators reported that collaboration was one of the most successful aspects of Tech-Prep, a significant number also reported that relationships among partners were a barrier to implementation. In 30 to 40 percent of consortia, vocational educators' resistance to change, lack of local administrator support, and lack of collaboration between secondary and postsecondary educators or between vocational and academic educators were major implementation problems (Figure X.2).

Local implementation is often positively affected by state-level support

Technical assistance and other support from state agencies can facilitate the pace of and approaches to implementation at the consortium level. Nearly half of the consortium coordinators reported that a high degree of state-level involvement in and support of Tech-Prep was one of the most successful aspects of their consortium efforts (Figure X.3). The extent of consortia satisfaction with state efforts varied by state. In 18 states, more than half of the consortia reported that state-level support and involvement was a very important factor in implementation progress.

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APPENDIX A

LOCAL SURVEY RESPONSE RATES, BY STATE

TABLE A.1

LOCAL SURVEY RESPONSE RATES, BY STATE

State	Survey Sample[a]	Number of Respondents	Response Rate[b]
Alabama	27	27	100
Alaska	3	2	67
Arizona	15	15	100
Arkansas	13	13	100
California	63	44	70
Colorado	18	13	72
Connecticut	10	9	90
Delaware	1	1	100
District of Columbia	1	1	100
Florida	17	16	94
Georgia	58	46	79
Hawaii	4	4	100
Idaho	6	6	100
Illinois	30	28	93
Indiana	14	13	93
Iowa	6	5	83
Kansas	6	6	100
Kentucky	44	38	86
Louisiana	13	12	92
Maine	6	6	100
Maryland	16	15	94
Massachusetts	11	9	82
Michigan	38	37	97
Minnesota	24	18	75
Mississippi	14	14	100
Missouri	12	12	100
Montana	4	3	75
Nebraska	6	6	100
Nevada	3	3	100
New Hampshire	2	2	100
New Jersey	20	15	75
New Mexico	13	10	77
New York	28	26	93
North Carolina	44	42	95
North Dakota	1	1	100
Ohio	13	13	100
Oklahoma	10	10	100
Oregon	20	7	35
Pennsylvania	21	18	86
Rhode Island	1	1	100

TABLE A.1 *(continued)*

State	Survey Sample[a]	Number of Respondents	Response Rate[b]
South Carolina	16	16	100
South Dakota	4	4	100
Tennessee	14	14	100
Texas	25	25	100
Utah	9	8	89
Vermont	9	4	44
Virginia	27	21	78
Washington	18	15	83
West Virginia	11	11	100
Wisconsin	16	12	75
Wyoming	5	3	60
Puerto Rico	1	1	100
Virgin Islands	1	1	100
U.S. Total	**812**	**702**	**86**

SOURCE: Inventory of State-Level Tech-Prep Activities, fall 1993.

[a]The survey sample was defined as all Tech-Prep consortia that had received Title IIIE funding for FY 1993.

[b]The survey response rates were calculated as the total number of respondents in each state divided by the eligible sample in that state, multiplied by 100.

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